

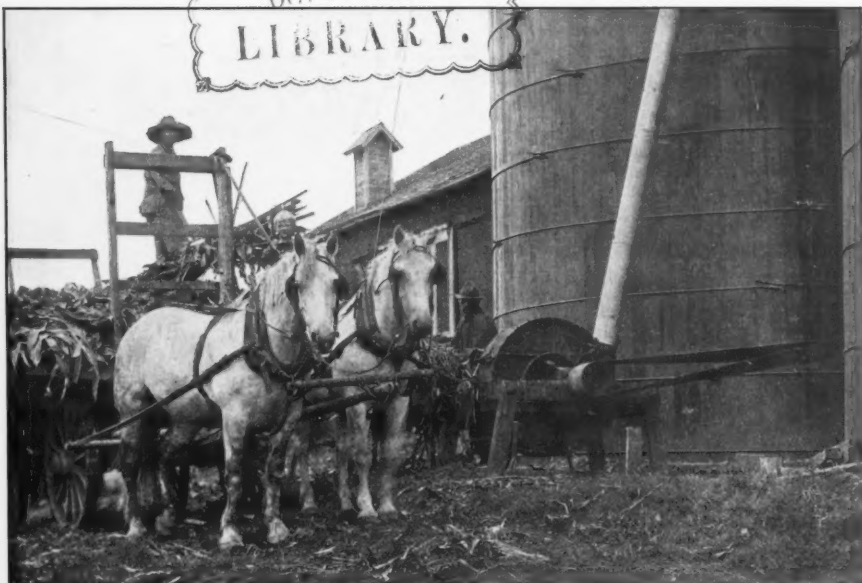
VOL. XIV. NO. 1

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# THE CORNELL COUNTRYMAN

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TEACHING, NOT TELLING

By L. H. BAILEY

CORNELL FORESTERS IN CAMP

By THEMSELVES

OPPORTUNITIES FOR WOMEN IN AGRI.

By J. L. STONE

PRACTICABILITY OF MILKING MACHINES

By P. W. WING

## OCTOBER



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**Professor A. R. Mann—the newly appointed Acting Dean**

# THE CORNELL COUNTRYMAN

Vol. XIV

ITHACA, N. Y., OCTOBER, 1916

No. 1

## Teaching, Not Telling

BY DR. L. H. BAILEY, ITHACA, NEW YORK

WHEN Professor Hunt came to Cornell, he dropped a phrase which impressed me greatly. It was, "Teaching, not Telling." I had it lettered in paint on a large sign-board and it was hung in the office of the College of Agriculture in Morrill Hall. Every teacher and student came and went through the one office in those days, for narrow was the way and few were they who went in thereat.

There are not many teachers, but there are many who give information with great charm, exactness, and in astonishing variety. It requires much self-constraint not to instruct the pupil, but only to teach him. The example of a life with enthusiasms and the value of suggestions that stimulate and direct, are very great forces in the world of men and much to be desired.

I must relate a story of Professor Roberts that bears on this subject. I think it has not been in print. It is now many years since the incident occurred, and I may not give it correctly in all details but I cannot miss the essence of it. It was in the days when farming folk were opposed to college teaching in agriculture or were indifferent to it, and yet they called on Professor Roberts for help. They never called in vain. This time a group of farmers wanted him to come to them to explain how to save the fertility of their lands. They came together in a hall, and "the professor"—there was only one real "professor" in those days—arose to address them. He said there was a farmer who had his

granery-bin full of wheat. One day the man noticed a cone-shaped depression in his bin of wheat; and every day as he drove in on "the barn floor" he would look into the bin and observe that the depression was broader and deeper, like a hopper. The loss of the wheat alarmed him. He called in his neighbors. They looked under the barn floor and saw a cone-shaped pile of grain under the bin; and as a team drove on the floor above, they saw the wheat sift down through the mouse-hole. They consulted for some time as to what they should do, till one of them exclaimed, "Let's send for Roberts." Agreed! And Roberts came, in a long black coat; and he had many big words that he pronounced with astonishing ease. He heard all they had to say. Then he went behind the barn, they all following, and putting his handkerchief on the ground he knelt down and looked for a long time under the barn; and when he got up he said gravely, "My friends, I advise you to plug up the hole."

Professor Roberts had made his speech. My reader will know that if there had been any opposition to the speaker there was opposition no longer: he had opened the way, and he had given in a parable an immense lesson in self-help. One can imagine the questions that came as those men began to examine themselves by interrogating the speaker.

The equipment of the class-room is becoming very interesting and very perfect and complete. I am glad. I am

wondering whether the apparatus and the pictures and the graphics ever stand as a barrier between the teacher and the pupil, because no person ever teaches until he gives himself to his pupils. Assuredly, the apparatus does not spoil a good teacher, neither does it make one.

In school and college alike I am led to feel that the entertaining of the pupil or the student is increasing as a method in what is called education. There are short-cut methods to instruction and the introduction of many aids and of illuminating tests and experiments; and the pupils all go through one process and, I fear, come out largely one product. Everything must be completed before the pupil's eyes, and we tend to lose the value of suggestion that leads the pupil to wonder and to desire to walk alone.

I have long felt that the introduction of agriculture into the schools will do much to correct these deadening and formalizing tendencies. Itself it is new and fresh as a school subject. It deals with the great out-of-doors. It cannot be brought into the class-room in the form of specimens. The questions are asked in the school-room, and the answers must be sought in the fields and barns and orchards. In no subject is there greater opportunity to employ the method of fertile suggestion,—the suggestion that shall stimulate the pupil to look, to understand, and to find a solution for himself and to have a personal reason for it. The great means in education is the suggestion and the direction that lead to a result.

It is important in this great fresh work, which is to relate the school in a new way to the people at home, that we do not too much standardize it and that we do not introduce too much apparatus and too many processes between the pupil and the objects. The teaching of agriculture lends itself all too easily to information-giving and all too readily to entertainment; and we may be in danger of mistaking the abounding interest of the pupil and of the parents for real results in education. And I hope that this teaching will not be

seized of the dominating desire to be up-to-date with the moods and notions of the day.

To be specific for example, I am much in doubt of the effort to make free use of moving-pictures in the teaching of agriculture. No doubt it is possible to use them educationally, but if I may judge by what I see elsewhere their value in this regard in most hands will be slight and they may easily stand in the way of real acquisition by the pupil himself. The character of the pictures is not the point at issue, but the fact that a very seductive form of entertainment may come to take the place in the pupil's mind of enjoyable and profitable effort of his own.

There are moving things in abundance on the farm. The action is everywhere and it is evident. The reality is always better than the picture, and particularly if the picture itself is not real. All this action should be organized into the instruction, proceeding regularly and with a consecutive purpose. The habit of mind that is developed by any kind of entertainment is more important than the entertainment itself. I am not here speaking of moving-pictures as a form of entertainment in public halls and places of amusement, but of the desire that I frequently hear to add them to the school equipment as a means of teaching agriculture. I have suggested or approved many forms of activity for the rural people, but I am not yet able to include "the movies" as an important means of rural betterment, however much they may be desired for other purposes.

We must teach and not tell. There are boundless possibilities in this new field of agriculture-teaching. The apparatus will be good and the graphics will be good; but better than these is the teacher who is full of his subject, who waits to teach, who will give himself and will depend little on exterior aids; and this teacher must be well paid and well supported. No apparatus and no machine must ever take the place of the human touch; for it is the human touch that teaches.

## Cornell Foresters in Camp

WRITTEN BY THEMSELVES

ON the night of July 23 twenty-one Cornell seniors, five graduates and one special student boarded the train at Ithaca, bound for camp on the Luther Preserve at the south end of Saratoga Lake. Faculty and students alike had a feeling of relief in getting

bore no such resemblance after the first lecture ball came across the plate. In a couple of days a little street of brown tents appeared, at the head of which stood a forty-foot white pine flag pole, carrying the United States flag and that of Cornell. Camp was established and



CAMP CORNELL

away from Ithaca at the end of a six weeks' grind in the heat of the third term. It was, however, a jumping from the frying pan into the fire, so to speak, since the first few weeks following were just as hot as Ithaca weather can be.

Railroads having dallied overtime with the freight, everybody slept on the ground or on the floor in the building newly erected by Mr. Luther for the department's use as mess hall and lecture room. Nobody particularly enjoyed it, excepting the mosquitoes that were lying in wait for a Cornell meal. Two days' delay in the freight shipment made no difference: lectures and field work came off on schedule time. If camp had seemed like a vacation in anticipation it

the students soon acquired a working knowledge of the tract.

### The Luther Preserve

The Luther Preserve, as it is called, includes about 3,500 acres of land, and is situated just south of Saratoga Lake. That such a wild, uncultivated stretch of country can exist so close to such industrial and social centers as Mechanicsville and Saratoga Springs will come as a surprise to many. There are very few houses on the tract and three deer were seen in July within two hundred yards of the forestry camp. The rather open stands of pitch pine scattered over sandy wastes, and the almost impenetrable swamps, in which tamarack and occasional black spruce are found, give one the feeling that he is separated by



many miles from civilization. All this is accounted for by the fact that the soil is a very loose sand, practically unsuited to agricultural purposes and what few people attempted to farm the land were discouraged by the poor crops obtained, and in most cases the fields formerly cultivated have been allowed to revert to forest.

Physiographically the country presents some interesting features. The stretch of sandy country which reaches from Schenectady in a northeasterly direction is described as the Upper Hudson Sand Delta Region, and is marked by rolling country of relatively slight topographical relief, few streams, which usually have their origin in springs or swamps and in several places by sand dunes which are shifting actively. The slight variations in composition of the soil, together with the changes in exposure occasioned by the topography are sufficient, however, to cause marked differences in the character of the forest, and on the Luther Preserve the forest types include pitch pine, white pine, hardwoods, and swamps, each with their characteristic growth. In the ravines where soil and moisture conditions are the most favorable, the forest growth is good, but on the sandy plains, exposed to the winds, the trees are scattered and of small size.

#### What the Work at Camp is Like from the Faculty Standpoint

One Sunday an old "residentifier" visited the camp and queried, "Are you boys doin' a little plantin' or just a little trimmin' up?" It was neither one nor the other for midsummer is not the season for planting on sandy plains, and foresters are not tree doctors though the term "City Foresters" might lead one to suppose so.

No, the work at camp is instruction in the theory and practice of practical forestry. Then the question comes, what is Forestry? "The science and art of producing successive wood crops and maintaining every desirable influence of the forest. The main branches of forestry are forest policy, *silviculture*, *forest management*, forest protection and

*forest utilization*." The work of the camp centers on these subjects which are in italics; for these, in order to be properly learned, require field work on a forest tract and the ideal time for such instruction is the summer season.

The seniors pursue three main courses of study: *silviculture*, that is, the art of producing and tending a forest; *forest mensuration*, which is the foundation of forest management, dealing with the determination of the volume of stands, trees, logs and other timber products and with the study of growth and yield of trees and stands; and *forest utilization*, which concerns itself with the ways and means of harvesting the forest crop.

Lectures and recitations are held three mornings of the week and are conducted precisely as if the class were in Ithaca. The other three days are given up to field work in the subjects mentioned: at the outset, two days of each week to the forest survey, that is, to timber estimating and mapping, in squads captained by the graduates. Later, one day only is given to mensuration and special problems in silviculture are assigned to the seniors for study and investigation in the field. Wednesday is alternately devoted to an all day field trip in silviculture and in utilization. The silviculture days include practice in marking timber so that reproduction will follow the cutting and the forest be perpetuated, visits to forest nurseries, and the like. The utilization trips are made to near-by logging and milling operations for a study of methods at first hand.

The graduate students have had all this drill in the previous summer. They have attained the eminence of a B. S. degree and are candidates for that of Master in Forestry. They continue the study of forest management—that is, the application of forestry in the conduct of the business of a forest—and prepare jointly a *working plan* for the tract on which the camp is held, that is, the plan under which the forest property is to be continuously managed. In addition, weekly seminars are held, usually in the field, in which the entire faculty participate. Besides this, each graduate



student is busy gathering data for his thesis and in the field of his "minor" subject. They have lectures on two days of the week and field work and individual research the other four. They are also given practice in forest engineering, so they have no time to regret the lost pleasures of undergraduate days. The relation of the graduates to the faculty is particularly close and, by giving

#### What the Camp Signifies

Although the foremost purpose of these ten weeks in camp is practical training of the students in forestry, it has a far greater significance. It builds character day by day, develops latent ability and self reliance and greatest of all it unites the men in a spirit of intense loyalty to Cornell University.



FACULTY WASHDAY AT CAMP CORNELL

them responsibility such as the captaining of crews and the preparation of the working plan, they are made to feel themselves as foresters with all the proper pride of a professional man in his chosen calling.

There is no schism between undergraduates and graduates. The younger men "jolly" the graver alumni but with respect, nevertheless, for their attainments. To paraphrase Lewis Carroll:

The seniors and the graduates were walking hand in hand

They wept like anything to see such quantities of sand

"If this could be reforested," said they, "it would be grand."

"If forty crews with white pine trees planted for half a year

"Do you suppose," the senior said, "they'd get a forest here?"

"I doubt it," said the graduate, and shed a bitter tear.

#### Camp Life as an Undergraduate Sees It

A Cornell man, wandering through these wilds and coming by chance to the spot over which flies the red and white banner, might think it to be a training camp for Cornell athletes. Crew men are here, pining wistfully for the water which is not; and track and cross-country stars tear through woodland and brush trailing jacob-staff and compass, breaking records from sheer force of habit. And Glee Club men harmonize recklessly and passionately during idle hours, which are few and far between, praises be to St. Murphy!—this last, be it known is the patron saint of foresters, in whose honor numerous ceremonies are observed annually. Very representative of Cornell, and the spirit of the university, is the Camp, and every forester in it is conscious at all times of the flag flying

over him and keenly aware of his responsibilities in this connection.

There are no rules and regulations at Camp Cornell; there is a spirit of mutual understanding between students and faculty that make these very unnecessary. Early in the game the conduct of the Camp was turned over to the students who elected a president and advisory board from among themselves, and what small responsibility there is for order in camp falls upon these men. The faculty stands aloof in such matters, inspiring us with their friendly advice and sympathy but interfering never. The system works wonderfully.

Somewhere around six in the morning we awake from our most gentle slumbers to hear the cookee bawling out the hour. And then do we rise forthwith and whistling cheerily don our scanty raiment? We do not. But slowly and reluctantly to the accompaniment of yawns and sighs and groans we venture forth into the morning, and the wash trough, and so to breakfast, which is



PLANNING TO MAKE 'EM WORK

ready very shortly after. Woe betide the dalliers, the sleepy men who stagger into the mess hall a minute late! Scorn and abuse and woodmen's curses are heaped upon them, and they slink away into the corners to hide their guilty faces in their coffee mugs.

There comes a short interval after breakfast during which all the tents from "Camp Early" to "Escondido" are made to look orderly. The names of our dwellings are truly poetic. Take for example Camp Early, Sawdusty, El Casa Seca, La De Da, Saharatoga, Oasis (the Camp store), North Star, Tahawus, Tom and Jerry, Millenium, St. Lawrence, and Escondido, to say nothing of the Jest Tent where we place visitors. At eight bells we take up our daily burden, which is a burden in name only. From Monday morning to Saturday noon all is work, and there is a pathetic little ballad which tells of this, to the tuneful melody of "Old Man Noah."

O, field work comes on Monday morn,  
Tuesday's task we lightly scorn,  
Wednesday we play round the mill,  
Thursday's dope's an awful pill,  
Friday's field work is a drill,  
Saturday's our vacation!

Chorus:

Sing, boys, sing with a will, there's nothing to do 'till fall,  
We, all, know we know a thing or two, because we know a thing or two, we think we know it all.  
There'll be nothing else to do,  
Sing, boys, sing with a will, there's nothing to do 'till fall.

And then from the tents of the "Prof's" comes this convincing retort:

So, the studes thought that they had a lunch,  
But the Profs. they had a hunch;  
"Computations we'll require,  
No more sitting round the fire,  
Or the whole bunch we'll retire!  
This is no vacation!

Chorus, etc.

Then some cold evening in the latter part of September the voices of a sadder, wiser lot of foresters were lifted after this wise:



REAL WORK AT CAMP CORNELL

O, the way we worked was an awful crime,  
Exams. came off on schedule time,  
Six reports before we go,  
Curves and card index, also,  
Each man said, "I'm feeling rather low,"  
It's been no vacation!

Chorus, etc.

But in spite of songs and what they seem to tell, work is no real hardship at Camp Cornell. We sally forth cheerfully into the woods in the early morning with compass and with chain and return at evening no less cheerfully, but tired, and hungry enough to keep "Hen" Powell, the best little cook in the country, on the jump.

On recitation days comes the gruelling that tries our souls and leaves us mentally very weary. But the spirit of competition enters even here, and we all manage to worry through the day, somehow.

From Saturday noon till Monday morning no work is scheduled, and that time is our own to do as we will. Some of the men put packs upon their shoulders and go exploring yet further into the wilds, sleeping many miles from camp out in the open, and returning in time for the work on Monday.

Sometimes we have visitors. It is recorded in the "Camp Log" that on one such occasion we entertained a distinguished guest by allowing him to assist

in a formal inspection of Camp. Every tent was most carefully inspected by the student advisory committee—each tent having previously been "planted" with various and sundry articles—and our visitor had the surprise of his life at the nature and quantity of the contraband found. Let the reader draw on his imagination for the rest!

Often in the evening before we settle down to work there are those of us who wander out from Camp to Ant Hill from which we watch the sun setting beyond the Adirondack foothills, the moon rising out of the Green Mountains of Vermont, while away to the southward is the gray of the Catskills. And presently we wander back to the mess hall where under the oil lamps, many heads are bowed over the pitch pine tables, reading of "steam niggers," basal areas, and the shelterwood system.



"HEN" POWELL,—THE COOK AT CAMP CORNELL

## Bureau of Soils, U. S. Department of Agriculture

BY MILTON WHITNEY, CHIEF, BUREAU OF SOILS

THE chief activities of the Bureau of Soils of the U. S. Department of Agriculture are the soil survey, fertilizer investigations, and studies in soil physics and soil chemistry. All the employees of the Bureau, except a small clerical force, are trained men, who have specialized in certain branches of scientific agriculture.

The soil survey is engaged in classifying and mapping the soils of the country. It employs 55 to 60 field men who are classed as "scientists in soil survey." In addition, the Chief of the Soil Survey is assisted by five inspectors who supervise the work in different sections of the country. When an area is to be surveyed, the area or unit of survey generally being a county, the work is assigned to a field man, with one or more assistants to be commenced upon the completion of other work. In this way a number of surveys are kept in progress. A large number of the states cooperate with the Bureau in prosecuting soil survey work, and furnishing men to assist the field parties. The average soil survey requires five or six months, and the work is so planned that areas in the southern part of the country are surveyed during the winter and areas in the northern part during the summer. Where satisfactory topographic sheets or county maps are not available, it is necessary to make a plane-table traverse survey. The field man is equipped with a compass, an odometer for measuring distances, a soil auger for taking samples and generally with a plane-table for correcting or constructing a base map. In mapping the soils the men drive along the roads, going into the fields often times to the distance of one-half a mile, depending on the character of the country and the location of other roads. Here they make frequent borings. They examine the soil material as encount-

ered at various depths, noting the texture, color and structure, the presence of coarse material, the drainage, and the character of the crops or native vegetation. The soil type is indicated on the field sheets, from which the soil map is later constructed, according to the nomenclature used by the Bureau of Soils. When, as the work proceeds, a change is noted in the material sufficient to cause it to be classed as another soil type, the boundary between the two types is traced, and shown on the map. The character of the vegetation or the physiography is frequently an important aid in distinguishing between soil types. Samples from the borings may be sent to the Bureau for mechanical analysis to determine the grade of the material and for such chemical examination as may be of value. While in the area the field party makes a study of the local climatic conditions, the geology of the region, and the agriculture. After the work is completed a report is prepared, for publication in connection with the soil map, giving a brief general description of the area, a discussion of the agricultural and climatic conditions, and a detailed description of each soil type mapped.

In describing the general area surveyed, the report discusses the topography and elevations, the regional drainage, the population, the towns, transportation facilities, and markets for farm products. The climate is treated, in its relation to agriculture. The report discusses the agriculture of the area, including its development and present status. The influence of soils or topography on agriculture is given, and the general type and methods of farming are described, including the equipment-used, the cultivation given the various crops, the crop rotations practiced and the fertilizers applied. The size of the farms and the value of farm

land is given, and reference is made to such subjects as labor and tenure. A general chapter on the soils discusses their origin, mode of formation and lithologic character, their relation to geology and physiography, and their distribution and classification with the soil series established by the Bureau of Soils. In the detailed type descriptions,

to the inch. Occasionally the Bureau undertakes special lines of work, and soil survey men are assigned to such work as making a special study of peculiar soil conditions or particular classes of soils, such as rock soils and fruit soils, or assisting the Reclamation Service in locating some of their important projects, and aiding the Forest



**Bureau of Soils Making Borings in Their Field Work**

the color, texture, and structure of the soil and subsoil are discussed, including such other features, as the substrata. The extent, importance, topography and drainage of the type, its relation to agriculture, including the type of farming practiced, the crops grown and their yields, and the general methods followed, are all treated. The improvement of the type, and its proper utilization and treatment are discussed. In addition, the report deals with such special conditions in the area surveyed as irrigation and drainage.

In making the detailed soil surveys, the maps are made generally on the scale of one mile to the inch, and in taking samples, borings are made to a depth of three feet in the eastern surveys and six feet in the western surveys. Reconnaissance surveys of larger areas are sometimes made, the maps being made on a scale of four to six miles

Service in classifying agricultural lands. The soil survey has reached all parts of the United States, and parts of Alaska, Porto Rico, and the Philippines. In addition to its practical value in determining the character and agricultural value of the land, the surveys form a basis for the investigations of other agricultural workers throughout the country.

#### **Fertilizer Investigations**

Another important line of work is the investigation of fertilizer resources. This work is done mainly in the laboratories of the Bureau. Its object is to determine sources of supply of the fertilizer ingredients, phosphorus, nitrogen, and potash, the search for fertilizer sources being stimulated at present by the scarcity of potash and the high prices of phosphates and nitrogenous materials. When a material is suggested as a possible source of supply, chemical



analyses of samples are made to determine its fertilizer value. Methods for producing fertilizer from known sources are investigated, and new methods are devised. In addition new sources of supply have been discovered, such as the giant kelps of the Pacific Coast. The work involves chemical and electrochemical research. The men engaged in it are trained chemists, and their work is along the lines of fixation of atmospheric nitrogen, volatilization of phosphoric acid, recovery of potash from mineral sources, such as alunite, natural sources, such as the giant kelps. The rendering of garbage and other city wastes for fertilizer is also investigated. In addition to the work in the laboratory, considerable field investigation is necessary.

The Bureau keeps in close touch with the development of the industry of extracting potash from giant kelps on the Pacific Coast, and plans have been made for the establishment of a government experiment and demonstration factory in co-operation with the Bureau of Fisheries experiments to be made in transplanting kelp plants along the Atlantic Coast, to afford a source of potash near the large fertilizer markets. The possibility of extracting potash from feldspar and other silicates, as a by-product of cement mills and blast furnaces, is being called to the attention of manufacturers. Where analyses of samples of the flue dust now volatilized and lost, show a sufficient potash content to warrant an expenditure for apparatus to recover it, the company is advised of the possibility of profitably installing such apparatus. The extraction of potash from wool scourings is being investigated, to determine whether companies engaged in cleaning raw wool may profitably produce potash as a by-product. Various methods have been worked out for treating alunite for potash.

The fixation of atmospheric nitrogen receives considerable attention. An electrical furnace is in operation, working on the problem of volatilizing phosphoric acid and fixing nitrogen in one operation. Apparatus has been installed

for experimenting with the Ostwald process of oxidizing ammonia for the production of nitric acid. Apparatus and processes for rendering garbage and other wastes of use as a fertilizer for their nitrogen content have been devised, and some work is done in determining the availability of various nitrogenous fertilizer materials when applied to the soil. The subject of ammonia as a by-product of coke ovens is being investigated.

An electric furnace is operated for volatilizing phosphoric acid from phosphate rock. In connection with this work the possibility of economically collecting phosphoric acid by means of the Cottrell precipitator, instead of passing the fumes through absorption towers, has been worked out. Experiments are conducted also to determine the fertilizer value of raw phosphate rock. The problem of extracting phosphate from the extensive beds of the rock in the West, so as to make it economically available to the large fertilizer markets in the East, is being studied, and is found to depend largely on the possibility of securing cheap water near the deposits.

A process for producing sulphuric acid, used by fertilizer manufacturers in the preparation of acid phosphate, has been perfected and patented.

#### Soil Physics and Chemistry

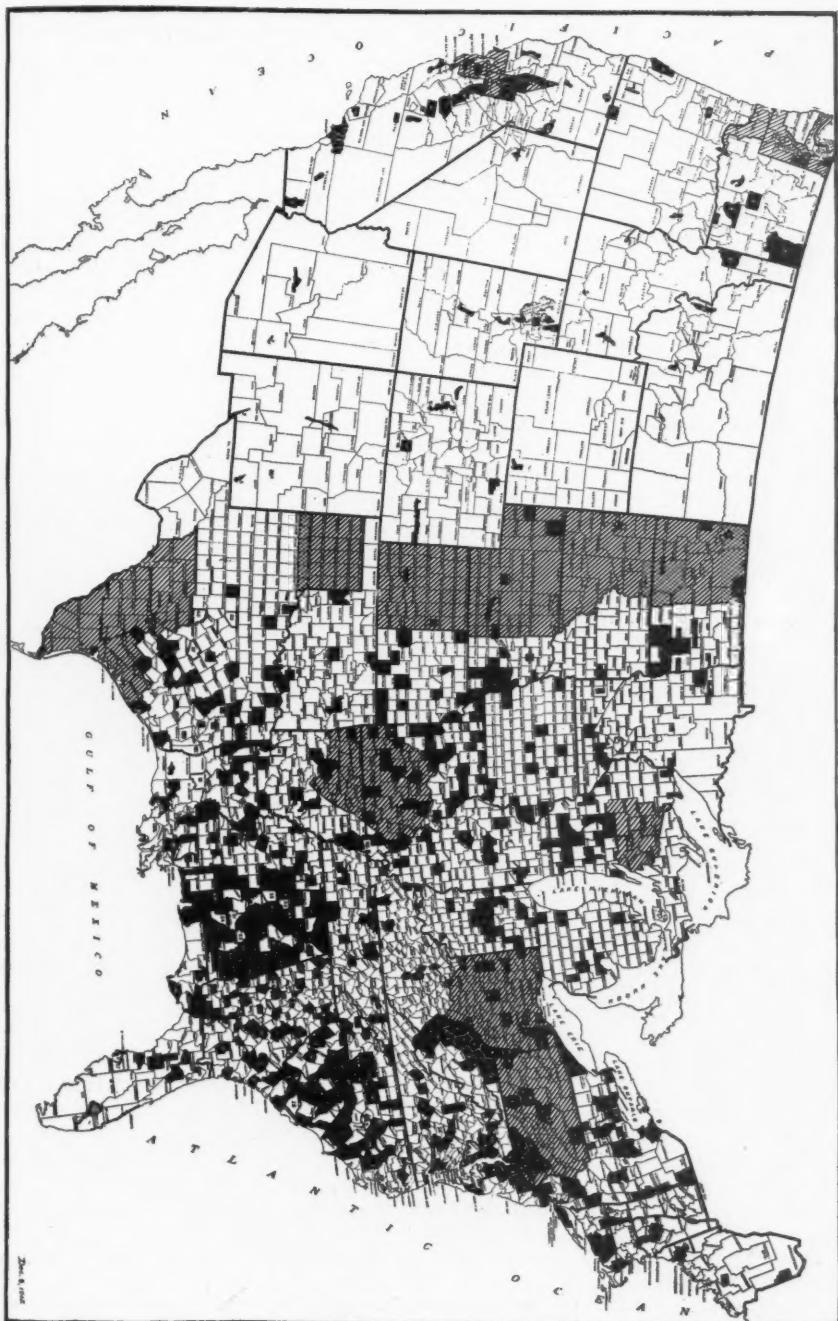
In the physical laboratories of the Bureau, in addition to the routine work of making mechanical analyses of soil samples, research work is carried on along several lines. The work is performed by men with a thorough training in chemistry and physics.

Mechanical analyses of samples of soil are made to determine the relative quantities of the different textured materials present, which are classified according to standard sizes of particles adopted by the Bureau of Soils. Many thousand samples have been examined, and apparatus and equipment have been perfected for making the analyses accurately and quickly. Sand sieves and a mechanical sieve shaker are used for



DETAILED SURVEYS  
 RECONNOISSANCE SURVEYS  
 SURVEYS IN PROGRESS

Showing Progress of Soil Survey Work



separating the coarser grades of material and a shaking machine is operated for shaking tubes of soil in solution so that the particles may be kept deflocculated until the silt and clay are washed from the sand. For the separation of the finer particles various forms of centrifuge are used. A compound microscope is used for determining the size of soil particles, and for many purposes a system of distilled water under pressure is of service. The various grades of soil material are carefully measured and weighed. This work is not only necessary in the proper classification of soils, but is of value wherever any substance is to be reduced to a given degree of fineness, as in separating graphite, limestone and fertilizers.

The research work in soil physics is directed toward an investigation of the textural relation of soils to their mechanical composition, to determine the relationship between the texture and structure and soil productiveness. This involves a study of the arrangement of soil particles, flocculation, and sedimentation. Soil temperatures or heat relations are studied to determine heat conductivity and the thermal relations of the soil to crop production. Soil temperatures are taken at various depths and under varying conditions of tillage and vegetable growth. Records are kept of solar radiations and the quantities of heat absorbed by the soil from the sun. Investigations with respect to freezing and thawing, in their physical aspects, are to be undertaken. The soil atmosphere, or the gases occurring in the soil, are studied to determine their composition and relation to various soil conditions. In the investigation of soil moisture, several practical problems are studied, including the utilization of rainfall and the relation of precipitation and run-off to soil erosion, the drainage of soils, the movement of moisture within the soil in supplying moisture for crop growth, and in changing the structural conditions of the soil due to variable moisture contents which

produce certain soil stresses. These stresses are studied as of especial importance to tillage operations and resistance to root development, and in relation to engineering problems.

The chemical laboratories of the Bureau are engaged in both research and routine work. The research work is along three general lines, (1) chemical analyses of soil samples to aid the soil survey in the classification of soil types, (2) studies of the composition of soil solutions to determine any consistent differences or similarities between different soil types or soil provinces, and of the relation of the composition of the soil solution to the productive capacity of the soil, and (3) investigations of the relation of the inorganic chemical composition of plants to the composition of the soil, special attention being given to the presence and relative quantities of the rarer elements in plant ash. Considerable attention is given to the microscopic mineralogical examination of soils. The larger soil separates have been exhaustively studied, and satisfactory methods have been worked out; the finer silts and clays, however, furnish an interesting field for further research with a microscope of high magnifying powers. The microspectrograph is used in an experimental way for the determination of soil minerals difficult to identify by other means.

The routine work consists in the examination and analysis of soil samples to aid in identifying the soils and in determining reasons for unproductiveness. Chemical examinations are made of irrigation water, alkali crusts, and materials of possible fertilizer value. The work in the chemical laboratories is performed by men trained especially in chemistry.

All the results of the fertilizer investigation work and of work in the physical and chemical laboratories are published in bulletins and scientific papers and circulars of the Bureau of Soils and of the Department of Agriculture.

# The Practicability of Milking Machines

BY PAUL W. WING, '15

**I**N ORDER that any machine may be said to be practicable it must possess the quality of being valuable in practice or action.

The modern milking machine or mechanical cow milker has reached such a stage of development that it may safely be said to be practicable. There are several ways in which it may be shown that a milking machine is practicable. Its main object is to milk and

enough common sense to be able to know when the cow is dry and how to give the machine the proper care. Before the cups are put on the teats the operator should be certain that the milk has started down into the teats, and after the teat-cups are in position he should be sure that the cow is milking freely before he leaves her to attend another cow. If a man will allow the machine to help him he can do as much work



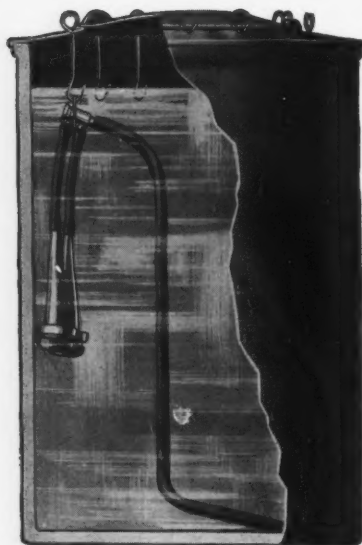
SHOWING DOUBLE UNIT MILKING MACHINES IN OPERATION

in its operation it must affect a saving in time which in turn means a saving in money. Also the method of drawing the milk from the cow must not only be free from causing undesired affects but it should have beneficial results. The machine should, to be valuable, improve rather than impair the already perilous condition of the labor question. Finally since it is a mechanical device it should be simple and durable.

There is no question but that most machines on the market today can milk most cows. The question that the farmer wants answered is, "How much milk will that machine get?" Some machines will get more than others just the same as some people will get more at hand milking than others. Then too the man operating the machine must have, not scientific mechanical training, but just

alone as three men can do milking one cow at a time by hand: this is a saving that anyone, having over ten cows to milk should seriously consider as being equally as important as using a team and mower to cut his hay rather than cutting it with the old fashioned sickle.

It is a well known fact that regularity of habit is more beneficial to cows than any other animals as regards production. If one desires the maximum production from a cow, whether on test or not, he is very sure to have the cow milked regularly and by the same person each time, for that person is more likely to have uniform strength of pull and squeeze and general manipulation in milking. It is in regularity that mechanical milking is far ahead of hand milking. The machine treats the cow in the same way every time. It always



**Showing how Milk Tubes and Teat-Cups are Sterilized by Being Kept in a Solution of Chloride of Lime**

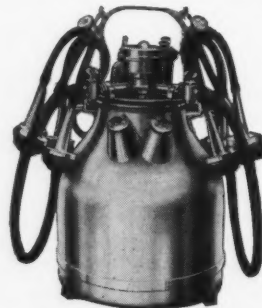
has the same strength of pull and squeeze and at the same speed and therefore gets the cow into the habit of letting her milk flow freely. There is never any injury to the cows teats from squeezing open old sores or from making new sores as a result of squeezing too hard. It is the experience of men operating the machines that injuries to the teats resulting from barbed wire cuts or from their being stepped on, heal up much more quickly with machine milking than with handmilking.

No one needs to enlarge on the increasing difficulty of getting competent men to work on the farm and milk from ten to twenty cows twice a day. With any good machine one should be able to milk single handed at least twenty cows an hour besides weighing and emptying his milk. This goes a long way toward solving the problem of farm labor, for not only does it lessen the actual work but it also puts a farmer in a position to have more men to choose from, for the simple reason that the farm hands do not have to sit down under the cows twice a day and suffer the discomforts

of hand milking. Men are more willing to work on a farm where a milking machine is used than on a farm where all the milking has to be done by hand. Dependable hand milkers are very very hard to get even at prohibitive wages.

Milking machines of the better type are today so constructed that they may be depended upon from a mechanical standpoint. They are operated in a manner that is easy to understand. They contain fewer parts, such as milk tubes, rubber teat couplings, complicated springs and levers and inaccessible parts where milk may lodge and escape cleaning operations. There are many farms where milking machines have been in constant use daily for years. In some places the same machines have been running for ten years with a remarkably low expense for up-keep and repairs. What other piece of farm machinery gives the same amount of service?

Another surprising feature in connection with mechanical milking is the fact that dairies which produce certified milk are finding that clean milk can be produced by the machine more cheaply and with more certainty than by hand milking. This may be explained by the fact that the milk pails are entirely covered and that the milk is conveyed from the teats to the pails in tubes which are easily sterilized, also that all the air which enters the



**This Machine Which Milks Two Cows at a Time, Keeps Each Cow's Milk Separate for the Purpose of Making Production Records**

pail or tubes for relief must pass through a cotton filter which holds all dust and dirt from passing into the pail. The points where care must be taken are in the cleansing of the apparatus and the udder and teats of the cow. Some machines, now manufactured, are very adaptable to the production of certified milk.

When buying a machine the intending purchaser will do well to consider the company back of the machine, its history and reputation, and the operation of the machine in the field. One

should study the principle of the machine and the action in the teat cups. He should buy such a machine as is simple and easily understood and manipulated; one which is well made and durable, having no excess of tubes and cupplings; one that may be readily taken apart, washed and sterilized. He will then, if he uses the small amount of necessary common sense, have a truly practicable milking machine—one which is now just as essential to dairying as is the cream separator and the power churn.

## Advantages of Refrigeration for the Farmer

A few Practical Hints from an Experienced Refrigerator Man

BY G. H. McKAY

**I**N ALL of our large cities there are many large cold-storage houses that have been erected for the storing of farm products. These have been used, not by farmers, but by speculators, who purchase the goods either from the farmer direct or from the commission man. The goods are purchased in summer or fall, when prices are very low and when there is a glut on the market. At this time of year the farmer finds it impossible to dispose of his goods to advantage, and consequently, at the end of the year, he finds the profit on the wrong side of the ledger. This may lead him to believe that farming does not pay.

The question is often asked, does it pay the farmer to erect and operate his own cold storage plant? A few examples will give evidence in favor of the affirmative.

At certain times of the year peaches are put away. Thousands of crates can be stored and a high profit realized from them after three or four weeks. This practice is somewhat new, but we have been gaining in knowledge, so that it may safely be said that it is possible to keep this fruit for three to six weeks, if at a very low temperature. In case they are not to be kept long, pre-cooling them is preferable to placing them in a hot car that has recently been iced. This applies as well to the shipping of

strawberries as any perishable goods that must be sent a distance.

Another good illustration is furnished in the shipping of eggs. For example, in summer, when the atmospheric temperature is often very high, eggs may be shipped safely if they are first given a good chill. They are then placed in the car, and will be found to be in excellent condition when they reach their destination. This pre-cooling is very important, since it is the heat to which the eggs are exposed previous to their being placed in storage which is often the cause of rots and spots.

Milk and cream can be cooled to the freezing point, and then shipped in cans that are jacketed with canvas and hair felt. In many cities it is necessary that milk shall be at a certain temperature when it arrives, and if it is pre-cooled it may be shipped in ordinary cans and will be at the required temperature when it reaches its destination.

Print butter is often kept at the freezing point for several hours and then packed in boxes. In this way it may be distributed to customers in good condition, even in summer. It may also be shipped a great distance if a small can of ice is placed in the center of the box.

The storing of apples is a well-established business. It has been the



general opinion that only late fall and winter apples should be refrigerated, but we find that summer and early fall apples also can be kept so that they retain their flavor. The different methods of storing apples present a question that is open to discussion. Apples stored in caves or cellars, or in any place where ice is not used, soon lose flavor, beauty, and quality by decay. Cold storage is to be preferred, since by this means apples can be kept without any loss and will always assure a good profit owing to the excellent appearance and flavor retained. This method will keep apples fairly well until the first of January, but after that they soon begin to deteriorate.

When ice is used for refrigerating, it should be placed overhead in bunkers, where there is good circulation of air, with a hot air flue which allows the hot air to rise over the ice and drop again on the other side, thus forming the necessary circulation.

One of the most profitable investments for the poultryman is to have a freezing room with a temperature of from 10 to 15 degrees above zero, where poultry weighing from one and one-half to two pounds is placed in single layers, dry-picked, properly labeled, and frozen. The poultry can be sold at any time from the first of January to the first of June, when they always command a high price. This cannot be done without a refrigerating plant. Old hens, which are fat in the fall, should be killed and placed in refrigeration until the first of March in order to avoid having to feed them. This has been done rather extensively and with good profit.

Last year was an exceptional one because of the overabundance of fruit everywhere and also because of the depression in business. For the 15 years preceding, profits of from 10 to 50 per cent had been made on food placed in cold storage, and not by the farmer but by speculators. For example, some of the fruit growers sold their apples at as low a price as \$1.50 a barrel, while others who stored their fruit received from \$3 to \$4.50 a barrel. Other grow-

ers who stored fruit in hampers—a cheap way of packing for local trade—received \$1 for a five-eighths-bushel basket. Farmers who have a local market could build a refrigerating plant in a town where there are railroad facilities. They would receive a handsome profit and more than double their income with very little expense and risk, and in case there were more goods than the local market could absorb the surplus could be sent to other places to be sold.

I believe that if farmers would organize in different towns and counties for the study of refrigeration and distribution of farm products, they would find this one of the most profitable methods of increasing the revenue that the farm affords. In the West, farmers have been enabled to store their crops in refrigerating plants and have found the practice to be of great advantage. In the East, with its millions of population, its fine transportation facilities, and its colleges turning out young men well equipped for scientific farming, there is no reason why every large town should not have access to a good cold storage plant. Thus the farmer's profits would be directed from the hands of the speculator.

Cold storage plants are growing in number and in storage capacity, yet the farmer finds it difficult to obtain storing room. This is good evidence that storing pays. In the last few years, thousands of small plants have been erected by farmers who have organized and put up their own storage houses. These have enabled the farmers to make good profits, and the cold storage plants to declare good dividends.

It is no more difficult to build a cold storage plant than an ice house, with the exception that for the former more care must be taken with the insulation. The erection and operation of a refrigerating plant is very simple; almost any one who is capable of operating a farm would be qualified to manage a cold storage house. The cost of a refrigerating machine is low and its maintenance is economical, especially if the farmer has access to a small stream.



# A Small Trout Producing Plant for the Farm

BY G. C. EMBODY

Professor of Entomology, New York State College of Agriculture  
at Cornell University

WITH the present limited knowledge of the financial side of fishculture, one would hesitate before advising any person to adopt it exclusively as a commercial enterprise. But, a farmer already possessing the necessary water resources might with profit invest in a small fish producing plant requiring comparatively little time for its operation and designed solely to supply his family with an occasional mess of fish. A pond for producing warm water fishes such as perch, bass, sunfish and bullheads, has already been described in the Cornell Reading Course leaflet No. 94 entitled, "The Farm Fish Pond," and more recently in a publication put forth by the United States Bureau of Fisheries under the title, "Fish Ponds on Farms." So many persons, however, have indicated a desire to know something about trout culture that a description of a small plant for this purpose seems timely.

I wish, therefore, to treat briefly of the essentials of a small establishment ample for producing annually about five hundred pounds of trout.

The methods may be either natural or artificial. In the former the trout are permitted to range over a large water area subsisting entirely upon natural food and breeding precisely as they do in wild waters. According to the latter method they are schooled together in small artificial basins, fed upon artificial foods and reproduction is forced. The term, intensive trout culture, is a good one to apply here.

With the natural method the initial expense of providing extensive forage areas is high, the current expenses low and the resulting output uncertain. The intensive method on the other hand requires a small initial investment, a large current outlay for food but the

output is relatively certain. I will treat only of the intensive method.

## Water: Quality Quantity and Control

The water is the first essential requiring consideration. Cold, uncontaminated and well aerated water is the only kind in which trout will thrive. The temperature must be constantly below seventy degrees for our native Eastern brook trout and for the rainbow and European brown trout, the maximum should not exceed seventy-six degrees.

It has been shown experimentally that for a given period trout require for respiration about twice as much oxygen as do ordinary pond fishes and also that a comparatively small amount of carbonic acid is fatal. The necessity of using water with a high oxygen and low carbonic acid content is therefore evident.

Water occasionally made roily by rains or melting snow will not directly endanger the health of trout unless polluted with decaying organic matter but it will deposit large quantities of mud in the various ponds, the removal of which will require much labor.

All of these facts show clearly the greater value of spring or artesian water over ordinary creek water. Occasionally spring and artesian waters are deficient in oxygen and a dangerous quantity of carbonic acid may be present. In either case the interposition of a series of falls between the water source and the ponds will correct the unfavorable conditions.

The quantity of water will depend upon the output of the establishment. In the present case it is calculated that the minimum must be about thirty-two gallons a minute or approximately what will be conducted by a two-inch pipe with a head of six or eight inches.

Controlling the water from a spring or artesian well is a simple matter. It is only necessary to construct a basin of

stone, brick or concrete from which the water may be led to the various ponds through a pipe, wooden sluice or even an open ditch. In the case of a small spring fed brook not subject to great floods an inexpensive dam of concrete or logs is placed in a convenient part of the stream. From the side of the pond thus formed, the water may be led through a pipe, sluice or ditch to the desired point. The height of the dam need only be sufficient to permit a gravity flow.

#### Laying Out the Establishment

The plans for a trout breeding plant will vary depending upon the varying conditions of land topographically. Those illustrated in figure 1 may not be suitable to every farm, nevertheless, they will probably serve as a working basis from which others may be derived to meet specific conditions.

A trout plant consists of many parts each concerned with some stage of its operation. In figure 1, we find:

1. A pond, F, for holding breeders from which the eggs are derived.
2. Hatching troughs, B, B, necessary conveniences for developing and hatching the eggs.
3. Rearing pond, C, designed especially to hold young trout until of yearling size.



Such a Stream as This May Supply a Trout Producing Plant

4. Rearing ponds, D, D, in which yearlings are grown to edible size.

All parts are usually placed as near to one another as possible and so arranged that the water from one may flow to another, to be used over and over again. This arrangement necessitates a slope from the water source to the outlet of the last ponds of the series.

Let us begin with the source of the water just above the dam at X and follow the circulation down through the plant. At A is a distributing tank of wood with dimensions approximately thirty inches long, twelve inches wide and sixteen inches deep. This receives water directly from the source and feeds the hatching troughs B, B, through two three-quarter inch pipes inserted about four inches from the bottom. Each trough is four feet long, fourteen inches wide and eight inches deep and is made of cypress or pine boards one inch thick. The whole is finally painted with a mixture of equal parts of turpentine and coal tar. At the lower end of each trough a hole is cut large enough to receive an inch and a quarter iron pipe which must not project above the bottom of the trough on the inside. This pipe leads down into a ditch or sluice so constructed that the water may be carried either into a sewer, I, or into pond C. Thus the troughs may be drained and cleaned of any sediment and the latter forced to flow into the sewer while the ordinary overflow is carried into pond, C.

Distributing tank, A, also supplies water to pond, F, through a three-inch pipe inserted in the end of the tank so that the bottom of the pipe is at least six inches above the bottom of the tank. In such a position the flow of water into the hatching troughs will not be interfered with.

From ponds, C and F, the water flows into an equalizing basin, K, which contributes an equal amount of water to each of the rearing ponds, D, D. From here it is carried through a ditch or pipe back into the brook.

#### Details of the Ponds

Pond for breeders—In a wild stream,

brook trout spend much of the time in the deeper pools but as the spawning season approaches there is a general movement up stream to shoals of coarse gravel where the water is swift. Here a slight depression is made in the bottom called a nest, where the eggs are laid. The breeders then return to the deeper pools leaving the eggs to fate. It generally happens that other fishes find the nests and devour the majority of the eggs.

In constructing a breeding basin we take advantage of the knowledge of trout habits and provide a relatively, deep pool as, F, figure 1, with a shallow spawning race just above as, E, figure 1.

About two dozen of three or four-year-old breeders will be necessary, each requiring about three square feet of pond area with a total area of about seventy-two square feet. Convenient dimensions for such a pool are six feet wide by twelve feet long. A maximum water depth of three feet will suffice and this should be located near the outlet. From here the bottom may slope gently upward to a minimum depth of fifteen inches near the head of the pond. From the center to the sides there should likewise be a gentle upward slope to facilitate cleaning the pond.

The spawning race may be ten feet long by three feet wide with a water depth not exceeding six inches. The water level in the race is maintained about four inches above that in the pond by means of a low obstruction at Y. This will tend to discourage any but "ripe" fishes ready to spawn, from entering the race. In order to imitate natural spawning beds, the bottom of the race is covered with gravel of medium size to a depth of three or four inches.

Rearing ponds—Pond, C, is designed to hold twenty-five hundred young trout from the time they are one and one-half inches long until the yearling size is reached. It is four feet wide by sixteen feet long and has a water depth varying from about eight inches at the inlet to sixteen inches at the outlet.

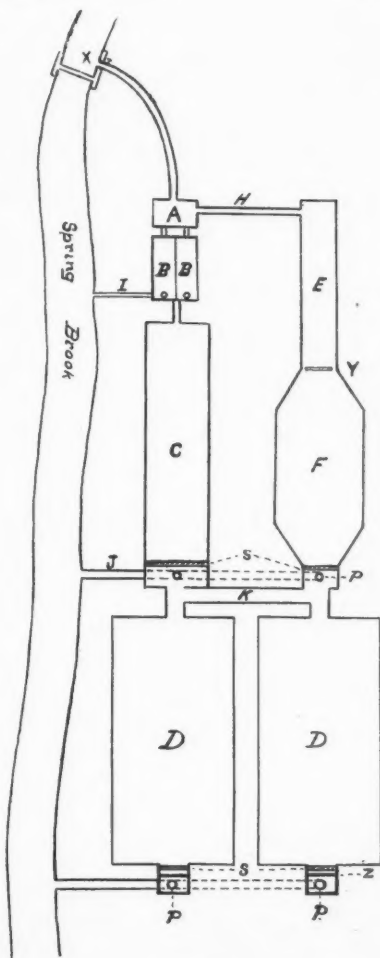


Fig. 1  
The Plan of a Trout Producing Plant

Ponds, DD, receive the yearling fishes and retain them until large enough for harvesting. Trout one and one-half to two and one-half years old and measuring seven to nine inches long are sufficiently large for this purpose. Each pond is large enough to care for eleven hundred and fifty trout. Its dimensions approximate eight by sixteen feet with a depth of water varying from eighteen inches at the upper end to three feet near the outlet.

Each pond is so constructed that it may be drained independently of every other, a condition easily obtained by inserting an elbow of cast iron or even vitrified sewer pipe in the pond bottom near the outlet as in P, figure 1. A plug of iron, lead or water-soaked wood is fitted into the end of the elbow opening into the pond. This is provided with a metal ring that it may be pulled out easily with a rake or hook. The other end is connected with a pipe which eventually leads into a sewer, J. These underground drain pipes constitute the only outlet for ponds, DD, and thus in order to maintain the proper water level in them, flash boards must be inserted in grooves at Z.

Screens or wooden gratings are necessary at the foot of each pond as in, S, to prevent the escape of the trout. A galvanized wire screen of one-eighth inch mesh is preferable for pond, C, containing the smaller fishes but in the other ponds, wooden gratings with slats spaced three-quarters of an inch apart will give better service. All screens should be made to slide in grooves in order to render their removal easy for purposes of cleaning and repair.

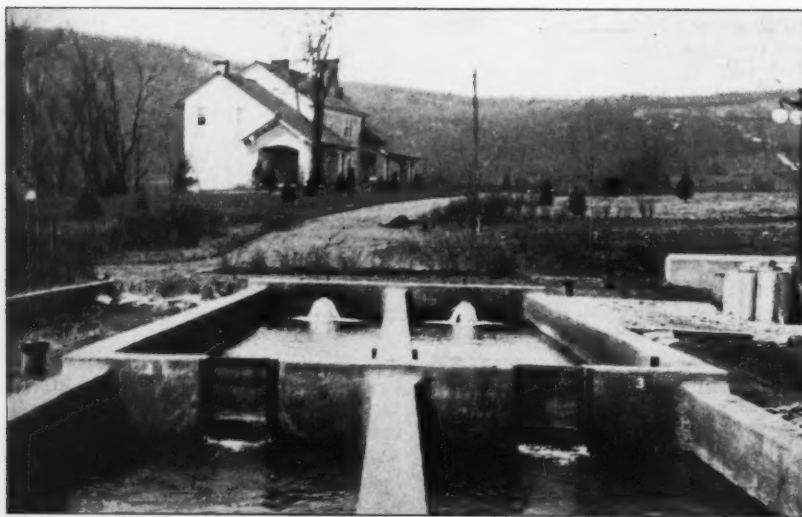
Materials of construction—The ponds here described have vertical sides and

hence require retaining walls or other means of protection. Reinforced concrete is probably the best material for this purpose for it is easily cleaned and, when properly constructed, is entirely permanent. It is also expensive and unless one has plenty of funds, he might with wisdom choose some other material.

Two-inch planks spiked securely to wooden posts, or sloping walls of brick laid up without cement, have been extensively used. In many parts of Europe and especially in Scotland the more gently sloping earthen embankments seem to have been preferred. The only objection to them is to be found in their care. It is evidently more difficult to keep them clean and to harvest the crop of fishes. Hollow tile is a recent product which has been suggested by one fishculturist but according to the writer's experience this material falls far short of the requirements.

In all trout ponds the bottom is usually covered to a depth of six inches or more with gravel or coarse sand. This prevents the water from becoming excessively muddy during various operations such as cleaning and draining.

Ed.—This article will be continued in the November issue.



A Comparatively Simple and Economical Trout Producing Plant

## A Word to the Class of '20

BY A FACULTY MEMBER

SINCE the editors of *The Countryman* asked me to write a few words to the entering class, I have spent a good many anxious moments thinking what I might say that would be of any real lasting value. I have gone so far as to put down on paper, not a few, but several thousand words of welcome and personal advice. If any of you feel the need of something of that kind, apply at the office of *The Countryman*. You will find none of it in this issue.

Testimony is always preferable to precept. As I look back on my own experience at Cornell, extending over a period of twenty years, and consider what has been of greatest value to me, I can not help reaching the conclusion that it has come, not from text books or lectures or athletics or fraternities or any other college activity, student or studious, but from the life of one man. Strangely enough, a man with whom I cannot call myself personally acquainted, a teacher whose classes I never attended, a resident of Ithaca whom I have seldom seen, and yet, if you care to fully understand your Alma Mater,—the motives, aims and ideals upon which it is founded—you will find their most complete expression in the life of this same man, our first president, Andrew D. White. Cornell is simply his dream come true, but it did not come by dreaming, as you will learn when you read of the conflicts which raged during the early history of the University.

You will hear a great deal about Cornell spirit; you will attend mass meetings on the Library Slope; you will lift your voice in the tumult and the shouting of Alumni Field; you will take off your

little black-buttoned cap and sing the old song in victory, and sometimes—not often—in defeat; you will be justly proud of our clean athletics, our standard of scholarship; you will be proud of the material resources of your college, its millions of dollars of endowment, its half a thousand instructors, its thousands of students. Possibly you will do a little bragging when you go home and meet men from other schools. But if you are looking for the deeper, inner significance, the true spirit of this institution, you will find it concretely exemplified in this one life and character.

Nothing that we can do or say can add to his honor or his fame. That rests secure in the record of the past. All we can claim is that we are his debtors. To him and to Ezra Cornell we owe far more than we can ever repay. They gave us our college. But far greater is our obligation to him, for he has given us himself, and that is why we regard him not only with gratitude and respect but with a deeper feeling that is no other than downright affection.

So I am not going to give you the greeting or the advice that the editors called for, but for your own satisfaction and the sake of our Alma Mater I hope you will become familiar with the life of Ex-President White. On a tablet of the gate he erected at the entrance to the campus, he caused to be engraven a sentence of counsel to the students of Cornell. No man who knows, who thoroughly understand and appreciates him can fail to follow out that sentence, can fail to become, as it is there expressed, more useful to his country and to mankind.

So enter  
That daily thou mayst become  
More learned and more thoughtful.

So depart  
That daily thou mayst become  
More useful to thy country and to mankind.



# Opportunities for Women in Agriculture

BY J. L. STONE

Professor of Farm Practice, New York State College of Agriculture  
at Cornell University

**M**ANY women, either from choice or from necessity, are interested in opportunities for independent careers. Many lines of employment not formerly open to women are now followed by them with success. A considerable number of women are taking courses of study in our agricultural colleges, and the question naturally arises, with what expectations may these women look toward agriculture for satisfactory careers, and what lines of agriculture afford the best opportunities for women in the capacities of proprietors or managers?

To know the number of women now engaged in various lines of agriculture and the proportion they bear to the total number of persons so engaged will shed considerable light on the subject, and fortunately the report of the last United States census gives the basis for computing such a proportion.

## Women in Agriculture in the United States

Total number of women in Agriculture,—	Proportion of Women to Total
Forestry and Animal Husbandry (all capacities) -----	1,807,501 1-7
Farmers -----	257,706 1-23
Dairy Farmers -----	2,576 1-24
Florists -----	1,501 1-9
Fruit and Nursery --	2,355 1-20
Gardeners -----	4,413 1-18
Landscape Gardeners	15 1-253
Stock Raisers -----	1,674 1-31
Apiarists -----	125 1-17
Poultry Raisers and Poultry Yard Laborers	3,607 1-4
Total number, exclusive of laborers ----	273,522

It is interesting to note in the table the very considerable number of women in the United States engaged in agriculture, exclusive of laborers,—273,522. It is safe to say that those lines of agri-

culture in which women are relatively most numerous are the lines that are best adapted to women. It is probable, however, that women are so few in landscape gardening because it is a comparatively new profession, and it should be noted that poultry yard laborers are included with poultry raisers.

It is manifest that the poultry industry and floriculture attract women in largest proportion, that apiculture and gardening stand next in order, and that fruit growing is relatively more attractive than general farming and dairying. The large numbers engaged in general farming—over 257,000—in comparison with the small number engaged in all lines of special farming—16,266—only reflects the general situation, that the vast preponderance of all farmers must always be engaged in general or mixed farming.

Farming differs from many lines of business in that it may be followed by persons of very different degrees of ability and skill with some degree of success. The profits are rarely large under the best of management, but the indifferent or poor manager is not so quickly forced out of business as in many other lines of work. Much of the work done on farms is of a character not to be adapted to woman's physical strength, therefore women will evidently be under the necessity of hiring a large proportion of the heavy work done by men. Warren's investigations show that the greatest of all cost factors on the farm is labor and that the question of the proper direction of farm labor is evidently the most important problem that the farmer has to meet.

As a rule, though it is not always the case, women find more difficulty in managing farm labor than do men. The average hired man does not like to take orders from a woman. It is evident, therefore, that a woman undertaking to



manage a farm will be laboring under a considerable handicap. To attain a given degree of success she must possess a considerably higher order of ability than a man who secures the same success.

That some women make a satisfactory success in managing farms is well understood. In the Agricultural Survey of four townships in Tompkins county thirty-two farms were found that were operated by women. The most successful of these women made a labor income of \$920, while the average labor income of all farms operated by owners in the district surveyed was \$423. The capital employed by this woman, however, was over \$16,000. There were thirteen farms in the district capitalized by over \$15,000, and the average labor income on these farms was \$1164. It seems that this most successful woman fell considerably short of the average success secured by all the farmers using similar capital. The average labor income made by these thirty-two women was \$137, which was a little less than one-third the average labor income made by all farmers in these four townships. This low average for the women is further explained by the fact that with a few possible exceptions, these women are concerned with the business of farming simply as a result of chance. It was not their choice to be farmers. Nearly all were wives or daughters of farmers and inherited their farms. About half of those who own farms continue to make the farm their home rather than rent it. A few of these women have taken up the business of farming and engaged in it actively. Others are living on the farms and accepting such incomes as the farms furnish, without making much effort to increase the business. If we could eliminate from the calculations the incomes of those who just lived on their farms and did not really farm them, the average income made by these women would undoubtedly be greater.

While general farmers must always largely out-number special farmers, it seems probable that women will usually

find some lines of special farming more attractive because better adapted to their peculiar abilities. The writer has interviewed persons in a number of the departments of the College of Agriculture as to facts and as to their opinions regarding women engaging in their line of work. The following statements are largely based on information thus gained.

The handicaps mentioned above that women meet in farming are probably experienced in full degree in connection with general farming and dairy farming, although some part of the work in dairying, such as milking and butter making, are often satisfactorily performed by women. The growing of tree fruits presents about the same difficulties to the woman manager, but a farm largely devoted to small fruits would seem to offer a woman a fair field for the exercise of the skill and tact that women may possess. Often women and children are employed quite extensively in connection with small fruit growing, and it is eminently fitting that they should be under the supervision of a woman.

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(Continued on page 56)

Each pond is constructed that it may be drained independently of every other, a condition easily obtained by inserting an elbow of cast iron or even vitrified sewer pipe in the pond bottom near the outlet as in P, figure 1. A plug of iron, lead or water-soaked wood is fitted into the end of the elbow opening into the pond. This is provided with a metal ring that it may be pulled out easily with a rake or hook. The other end is connected with a pipe which eventually leads into a sewer, J. These underground drain pipes constitute the only outlet for ponds, DD, and thus in order to maintain the proper water level in them, flash boards must be inserted in grooves at Z.

Screens or wooden gratings are necessary at the foot of each pond as in, S, to prevent the escape of the trout. A galvanized wire screen of one-eighth inch mesh is preferable for pond, C, containing the smaller fishes but in the other ponds, wooden gratings with slats spaced three-quarters of an inch apart will give better service. All screens should be made to slide in grooves in order to render their removal easy for purposes of cleaning and repair.

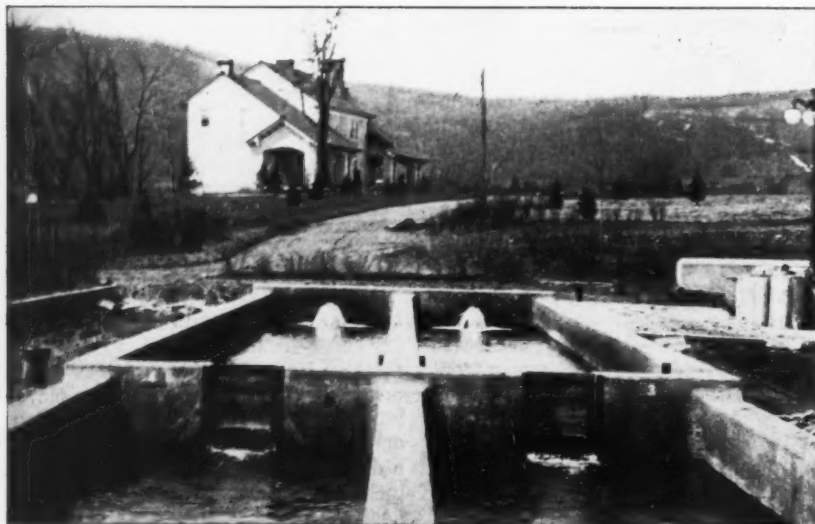
Materials of construction—The ponds here described have vertical sides and

hence require retaining walls or other means of protection. Reinforced concrete is probably the best material for this purpose for it is easily cleaned and, when properly constructed, is entirely permanent. It is also expensive and unless one has plenty of funds, he might with wisdom choose some other material.

Two-inch planks spiked securely to wooden posts, or sloping walls of brick laid up without cement, have been extensively used. In many parts of Europe and especially in Scotland the more gently sloping earthen embankments seem to have been preferred. The only objection to them is to be found in their care. It is evidently more difficult to keep them clean and to harvest the crop of fishes. Hollow tile is a recent product which has been suggested by one fishculturist but according to the writer's experience this material falls far short of the requirements.

In all trout ponds the bottom is usually covered to a depth of six inches or more with gravel or coarse sand. This prevents the water from becoming excessively muddy during various operations such as cleaning and draining.

Ed.—This article will be continued in the November issue.



A Comparatively Simple and Economical Trout Producing Plant

## A Word to the Class of '20

BY A FACULTY MEMBER

SINCE the editors of *The Countryman* asked me to write a few words to the entering class, I have spent a good many anxious moments thinking what I might say that would be of any real lasting value. I have gone so far as to put down on paper, not a few, but several thousand words of welcome and personal advice. If any of you feel the need of something of that kind, apply at the office of *The Countryman*. You will find none of it in this issue.

Testimony is always preferable to precept. As I look back on my own experience at Cornell, extending over a period of twenty years, and consider what has been of greatest value to me, I can not help reaching the conclusion that it has come, not from text books or lectures or athletics or fraternities or any other college activity, student or studious, but from the life of one man. Strangely enough, a man with whom I cannot call myself personally acquainted, a teacher whose classes I never attended, a resident of Ithaca whom I have seldom seen, and yet, if you care to fully understand your Alma Mater,—the motives, aims and ideals upon which it is founded—you will find their most complete expression in the life of this same man, our first president, Andrew D. White. Cornell is simply his dream come true, but it did not come by dreaming, as you will learn when you read of the conflicts which raged during the early history of the University.

You will hear a great deal about Cornell spirit; you will attend mass meetings on the Library Slope; you will lift your voice in the tumult and the shouting of Alumni Field; you will take off your

little black-buttoned cap and sing the old song in victory, and sometimes—not often—in defeat; you will be justly proud of our clean athletics, our standard of scholarship; you will be proud of the material resources of your college, its millions of dollars of endowment, its half a thousand instructors, its thousands of students. Possibly you will do a little bragging when you go home and meet men from other schools. But if you are looking for the deeper, inner significance, the true spirit of this institution, you will find it concretely exemplified in this one life and character.

Nothing that we can do or say can add to his honor or his fame. That rests secure in the record of the past. All we can claim is that we are his debtors. To him and to Ezra Cornell we owe far more than we can ever repay. They gave us our college. But far greater is our obligation to him, for he has given us himself, and that is why we regard him not only with gratitude and respect but with a deeper feeling that is no other than downright affection.

So I am not going to give you the greeting or the advice that the editors called for, but for your own satisfaction and the sake of our Alma Mater I hope you will become familiar with the life of Ex-President White. On a tablet of the gate he erected at the entrance to the campus, he caused to be engraven a sentence of counsel to the students of Cornell. No man who knows, who thoroughly understand and appreciates him can fail to follow out that sentence, can fail to become, as it is there expressed, more useful to his country and to mankind.

So enter  
That daily thou mayst become  
More learned and more thoughtful.

So depart  
That daily thou mayst become  
More useful to thy country and to mankind.

# Opportunities for Women in Agriculture

BY J. L. STONE

Professor of Farm Practice, New York State College of Agriculture  
at Cornell University

**M**ANY women, either from choice or from necessity, are interested in opportunities for independent careers. Many lines of employment not formerly open to women are now followed by them with success. A considerable number of women are taking courses of study in our agricultural colleges, and the question naturally arises, with what expectations may these women look toward agriculture for satisfactory careers, and what lines of agriculture afford the best opportunities for women in the capacities of proprietors or managers?

To know the number of women now engaged in various lines of agriculture and the proportion they bear to the total number of persons so engaged will shed considerable light on the subject, and fortunately the report of the last United States census gives the basis for computing such a proportion.

## Women in Agriculture in the United States

Total number of women in Agriculture,— Forestry and Animal Husbandry (all capacities) -----	Proportion of Women to Total
1,807,501	1-7
Farmers ----- 257,706	1-23
Dairy Farmers ----- 2,576	1-24
Florists ----- 1,501	1-9
Fruit and Nursery -- 2,355	1-20
Gardeners ----- 4,413	1-18
Landscape Gardeners 15	1-253
Stock Raisers ----- 1,674	1-31
Apiarists ----- 125	1-17
Poultry Raisers and Poultry Yard Laborers 3,607	1-4
Total number, exclusive of laborers ---- 273,522	

It is interesting to note in the table the very considerable number of women in the United States engaged in agriculture, exclusive of laborers,—273,522. It is safe to say that those lines of agri-

culture in which women are relatively most numerous are the lines that are best adapted to women. It is probable, however, that women are so few in landscape gardening because it is a comparatively new profession, and it should be noted that poultry yard laborers are included with poultry raisers.

It is manifest that the poultry industry and floriculture attract women in largest proportion, that apiculture and gardening stand next in order, and that fruit growing is relatively more attractive than general farming and dairying. The large numbers engaged in general farming—over 257,000—in comparison with the small number engaged in all lines of special farming—16,266—only reflects the general situation, that the vast preponderance of all farmers must always be engaged in general or mixed farming.

Farming differs from many lines of business in that it may be followed by persons of very different degrees of ability and skill with some degree of success. The profits are rarely large under the best of management, but the indifferent or poor manager is not so quickly forced out of business as in many other lines of work. Much of the work done on farms is of a character not to be adapted to woman's physical strength, therefore women will evidently be under the necessity of hiring a large proportion of the heavy work done by men. Warren's investigations show that the greatest of all cost factors on the farm is labor and that the question of the proper direction of farm labor is evidently the most important problem that the farmer has to meet.

As a rule, though it is not always the case, women find more difficulty in managing farm labor than do men. The average hired man does not like to take orders from a woman. It is evident, therefore, that a woman undertaking to

manage a farm will be laboring under a considerable handicap. To attain a given degree of success she must possess a considerably higher order of ability than a man who secures the same success.

That some women make a satisfactory success in managing farms is well understood. In the Agricultural Survey of four townships in Tompkins county thirty-two farms were found that were operated by women. The most successful of these women made a labor income of \$920, while the average labor income of all farms operated by owners in the district surveyed was \$423. The capital employed by this woman, however, was over \$16,000. There were thirteen farms in the district capitalized by over \$15,000, and the average labor income on these farms was \$1164. It seems that this most successful woman fell considerably short of the average success secured by all the farmers using similar capital. The average labor income made by these thirty-two women was \$137, which was a little less than one-third the average labor income made by all farmers in these four townships. This low average for the women is further explained by the fact that with a few possible exceptions, these women are concerned with the business of farming simply as a result of chance. It was not their choice to be farmers. Nearly all were wives or daughters of farmers and inherited their farms. About half of those who own farms continue to make the farm their home rather than rent it. A few of these women have taken up the business of farming and engaged in it actively. Others are living on the farms and accepting such incomes as the farms furnish, without making much effort to increase the business. If we could eliminate from the calculations the incomes of those who just lived on their farms and did not really farm them, the average income made by these women would undoubtedly be greater.

While general farmers must always largely out-number special farmers, it seems probable that women will usually

find some lines of special farming more attractive because better adapted to their peculiar abilities. The writer has interviewed persons in a number of the departments of the College of Agriculture as to facts and as to their opinions regarding women engaging in their line of work. The following statements are largely based on information thus gained.

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(Continued on page 56)



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## A Welcome—and a Parting Word

The new year has brought us under the administration of a new dean, Professor A. R. Mann. It is not necessary for the *Countryman* to introduce our new acting dean to its readers for already Professor Mann is known and most highly esteemed by all our alumni and undergraduates. He has been with us since his graduation in '04, and has gained the very highest admiration from all who know him.

For a time after graduation Professor Mann was an Assistant Professor in the dairy department. Then for six years he acted as secretary of the College where he gained an insight to its welfare and needs. Professor Mann's natural ability, his special training and his wonderful personality well fit him for this exacting position.

To you, Doctor Galloway, a parting word: Be sure that the student body will remember you,—your simplicity and kindness, your sympathy with our endeavours and your readiness to assist them.

## To the New Class

Members of the Class of 1920, we greet you to this institution and challenge you to play fair with it. You have gained membership to a college designed primarily to turn out rural servants.

We hope there are not among you those who come idly—sweepings of the Farming Fad. We also hope that none of you have come here because Agriculture is free, comforting yourselves in the assurance that an agricultural education is better than none at all and that a B. S. may mean a lot of things. We hope you are all among those who come here to gain rural knowledge, rural power, rural enthusiasm, and who intend to give back their winnings to the cause for which the College exists—the evolution of a satisfactory rural life.

**Dairyman's  
League Booms**

The New York State Dairyman's League has probably made more progress during the last few months than ever before in all its history. Keen interest and enthusiasm is rising everywhere throughout the dairy producing sections of the State. All dairy farmers in the State are wide awake to the dairy situation. They are beginning to talk it here and there wherever they go. Banks, merchants and all kinds of business men of our towns and cities are lending their aid in helping the farmers support the movement financially. With such a stimulation to the dairying interests, surely it seems that the time is not far hence when New York State milk producers will be able to command a better and more reasonable price for their product.

Prices on feed, labor, and nearly everything that the dairy farmer must use, have constantly advanced. Still the prices for his product have remained the same or possibly decreased. Is it not time that the dairymen of the State move and move together for that which they rightfully deserve?

The dairy industry of New York State, represented by a capital of \$100,000,000 invested in cows alone, is probably the largest phase of our State agriculture. Further than this, New York stands first in the United States for value of dairy products. At the Panama-Pacific Exposition New York State was awarded the grand prize for its milk and cheese exhibits. The farmers of this State are also near a wonderful market, 35 per cent of the entire population of the United States being within a radius of three hundred and fifty miles of New York City.

In spite of all this the prices for milk are so low that very few dairy producers of the State realize any profit in milk production. Many producers are just breaking even and probably the great majority are actually producing milk at a loss. If the dairymen like many other laborers adopted the eight-hour day system instead of their actual twelve or fourteen, the dairymen of the State would fail and New York City would be without a milk supply.

**A Good Spirit  
Ever**

There are those who can look back to the first days of this great institution of ours, when there were but a handful of students, when not more than one or two or three graduated each year, when all students and faculty knew each other intimately and then there are those—few they are and thankful too—who conclude that the rapid growth of the College from year to year has a natural tendency to break down that former unity and separate faculty from students.

True as this may sometimes be, if the growth be a natural and legitimate one—as we know it is—the results can not be such as to weaken

that unity. No, the logical results of our natural growth should be such as to make us a stronger power and a more solid unit. A fraternity does not cease to be a brotherhood after it begins to grow. Neither does a family cease to become a unit when it grows. Besides, as the student body of the College has grown, so also has the number of instructors and professors.

Possibly both have grown to such an extent that when a freshman comes to College he is at first often times astounded with its magnitude and size. Many of our classmen do not realize that there are professors here in the College—and many of them too—who are entirely approachable, professors who are only too glad to help them work out their problems. Many of our entering students, not knowing much about professors, seem to have the idea that they are something like monks of which they read in Ancient History. No, not so, these professors in the College are real human beings who may be the dearest of the students' friends. Let us get acquainted with them and every one else in the College. Let us do all in our power to create an atmosphere of fraternalism and brotherhood—for after all we are just one big family.

No matter how wonderful our College may be at present, we can accomplish a lot toward making it a little better if we will but boost—boost our University—boost our College—and boost our professors. We should not feel this a task or drudgery, for it is not. It is an opportunity for every one of us. It may be accomplished by just a little co-operating. If we don't work with our professors they surely can't work with us and visa verse if our professors don't work with us we can't hope to work with them. Co-operation is the word of the day. Before we can ever hope to co-operate in our own home community we must first learn to co-operate here in the College—co-operate for one, big, lasting unity of brotherhood.

**New York  
State Best**

Of all the places to farm probably New York State is one of the best areas that can be found. New York has steadily progressed in agriculture and there is every indication that this progress will continue. It is well understood that this State has big advantages over Western States with regard to marketing. Commissioner of Agriculture, Charles S. Wilson, states that the price of land in this State is lower by fifty and seventy-five per cent, than that of other states in which there is no greater productiveness of soil. Of the ten million inhabitants of New York, eighty per cent reside in cities or villages, leaving but a small per cent engaged in agriculture. This insures a ready demand for farm products. Our transportation facilities are regarded as excellent. Although land in this State has been under cultivation for more than a century, it is still producing more per acre than ever before.



## Campus Notes

### **Professor A. R. Mann Appointed Acting Dean**

Following the resignation of Dr. Beverly T. Galloway, as Dean of the New York State College of Agriculture, which went into effect August 1, Professor A. R. Mann was appointed Acting Dean.

The new Acting Dean graduated from Cornell in 1904. For several years he assisted former Dean Bailey on his encyclopedia and later was appointed Assistant Professor in the Department of Dairy Husbandry. Following this he was made Secretary of the College of Agriculture for six years, giving him an intimate acquaintance with the instruction work. In the Spring of 1915 Professor Mann, went on sabbatic leave and took up graduate work in the University of Chicago. He completed this study in time to begin his new work as Acting Dean of the College.

### **Professor Clinton D. Smith Dies Suddenly**

On August 4 Professor Clinton D. Smith, a well known educator, passed away in Buffalo on his way to the Cornell Club Picnic at Frewsburg.

Clinton DeWitt Smith was born in Trumansburg in 1854 and was graduated from this College with the degree of Bachelor of Science in 1873. He did not at once take up agricultural work but for a time took graduate work and later practiced law at Trumansburg.

In 1890 he taught agriculture here in the College, and the next year went to the University of Arkansas. From 1891 to 1893 he was director of the Minnesota Experiment Station and Professor of Dairying in the College of Agriculture in the University of Minnesota, at St. Paul. In 1893 he was called to the Michigan College of Agriculture as Professor of Agriculture, which position he held until 1899. In 1895 he was also made director of the Michigan Agricultural Experiment Station, and in 1899 became dean of the short courses and was made college extension lecturer. He resigned from the Michigan Agricultural College and Experiment Station in 1908 to go to South America as president of the Agricultural College of Sao Paulo, at Piracicaba, Brazil.

He remained in this position for five years and was urged to stay longer but preferred to return to the United States. In 1913 he came back to his ancestral farm at Trumansburg, where he resided, but he kept up his active interest and participation in agricultural education by lecturing and teaching for the New York State College of Agriculture in its extension service.

Professor Smith leaves his wife, Mrs. Anna Cora Smith of Trumansburg and a brother in Nova Scotia. He had a wide acquaintance among agricultural educators in all parts of the United States and Brazil. He had been a leader, one whom the Brazilian Secretary of Agriculture recently character-

ized as the greatest educator Brazil has ever known.

The funeral was held at Trumansburg on August 8. The honorary pallbearers were Dr. L. H. Bailey, Professor A. R. Mann, Professor J. L. Stone, Professor G. W. Cavanaugh, Professor E. O. Fippin, Professor H. H. Wing, Professor D. J. Crosby, and Professor G. A. Works.

**Grangers Hear** Over 600 farmers and their families, coming  
**C. M. Gardner** from nearly every  
**at College** grange in the State, attended the annual picnic of the state grange held at the New York State College of Agriculture on August 18. The morning was given over to the inspection of the College and a demonstration of livestock in the judging pavillion.

In the afternoon a session was held in Roberts Hall. The first speaker introduced was Acting Dean A. R. Mann, who welcomed the Grangers and the speakers to the College of Agriculture. State Master S. J. Lowell of Fredonia, made the response.

Charles M. Gardner of Westfield, Mass., high priest, demeter of the national order, who holds the highest office in the national organization, then spoke. Mr. Gardner brought out two important facts in his address, first the great amount of good accomplished by the granges throughout the United States and second that to accomplish any good for the farmers it is necessary for all departments of agriculture, national, state and local, to work together.

In discussing his first point Mr. Gardner stated that the grange is just 50 years old and that in that time an untold amount of good has been accomplished. Because of the unselfish work of the members as well as the leaders of the granges throughout the country, the granges have grown from a small, unnoticed body of men to a position of national importance.

He said that among the most important works, accomplished by the granges, was the bringing about of the parcel post. Mr. Gardner stated that

the farmers alone were responsible for parcel post. Another great work accomplished by the granges is the obtaining of free mail delivery for the farmers, who previous to the introduction of the rural free delivery system were obliged to travel many miles to get their mail. The obtaining of good roads by the farmers Mr. Gardner said he considers one of the greatest works yet accomplished.

Mr. Gardner showed how the movement toward the betterment of agriculture is being carried out by government, states, experiment stations, agricultural colleges and granges. He also showed how there is one great danger in this, that if all of the institutions do not work together agriculture will not get the benefit of the work. He closed his address by urging the granges to work with the different agricultural stations and that only by this means could any great good be accomplished for the farmer.

Dr. Raymond A. Pearson, former commissioner of agriculture, now President of the Iowa State College of Agriculture, spoke briefly of the good work that has and is being accomplished by the granges throughout the State and urged those present to keep working for the betterment of agriculture.

**College Ditching** The College has  
**Machine at Work in** dug over 1000 rods  
**Tompkins County** of ditch in Tompkins County with their Buckeye ditching machine. The farmers pay only for the actual operation of the machine. The Department of Soils made free surveys and during the summer two drainage meetings were held, all in co-operation with the County Farm Bureau.

**High School Teachers** L. S. Hawkins  
**Hold Meeting Here** of the State Department of Education held conferences of the high school vocational teachers of agriculture and the teachers of home making at the College, August 1-4. Some seventy-five teachers of agri-



culture and twenty-five teachers of home making were in attendance. Dean E. B. Davenport of the Illinois College of Agriculture spoke at a joint meeting of these conferences on the afternoon of August 2 on "Connecting the School with the Farm as a Laboratory," and again in the evening on the "Changing Purposes of the Public School."

**Professors of the College Play Base-ball**

The base-ball association between the Departments of the College ended September 1 with a perfect record for the Plant Breeding Department. They contested six games in all, two with Plant Pathology, two with Plant Physiology, two with Vegetable Gardening and won them all. The Plant Breeding Department claims that their contestants were a strong bunch of players.

**College Professors Co-operate in a Big Drainage Demonstration**

On August 4 Professor E. O. Fippin of the Soils Department and Professor R. B. Robb of the Rural Engineering Department spoke before 1000 people at the drainage demonstration held on the farm of W. A. Peterson, '11 in Niagara County. In the process of constructing the 100,000 feet of drainage on Mr. Peterson's 100-acre farm, the New York State Drainage Association co-operated in holding a demonstration for New York State farmers. All of the land had formerly been surveyed by Assistant Professor W. W. Warsaw of the Soils Department and 10,000 of the 100,000 feet had been constructed prior to this season. A program preceded the demonstration at which time Professor Fippin spoke on, "The Theory of Drainage" and Professor Robb on, "Leveling." Among other speakers were B. S. Harwood and F. R. Stevens, agriculturist for the Lehigh Valley Railroad. At the close of the program the ditching demonstration began. The work was done by a Buckeye traction ditching ma-

chine, a Cyclone ditching plow, drawn by a Junior Holt Caterpillar tractor, and a ditching plow drawn by two horses. Dr. J. H. Squires of the Du Pont Company spoke on, "The Use of Dynamite in Draining" and demonstrated his talk by opening a ditch.

**Dr. H. H. Love Visits Sub-Experiment Station in California**

Dr. H. H. Love of the Plant Breeding Department spent the month of July in taking a trip to Chico, California,

which is a sub-experiment station of the Office of Cereal Investigations. The trip was made in co-operation with the Department of Plant Breeding at the College and the Office of Cereal Investigations at Washington, the purpose of the trip being to study and take note of the large number of wheat hybrids being grown there. The Department had formerly established this sub-experiment station in Chico, California, as it seemed to be the ideal place for making the desired study. While making the trip Dr. Love also visited the state experiment stations at Montana and Minnesota.

**A Successful School Fair**

On Friday evening, August 4, a school fair was held by the members of the summer school course entitled "The School." A program was given out of doors in front of the farm management building. Inside the building in the room that the class used during the summer an exhibit was arranged.

The program consisted of songs, folk dances, and games by the whole group of twenty-eight, of a demonstration and explanation of the Babcock test by three of the men, and of a dramatization of the fairy tale of "Hansel and Gretel" participated in by about twenty persons. Electric lights, covered with Japanese lanterns, furnished the illumination, and the audience of some three hundred persons were ranged in a wide semi-circle.

Following the program an invitation

was given to inspect the exhibit which had been prepared by the class to demonstrate work that children in rural schools might do in relation to their environment. There were mounts of trees, birds' nests, poultry feathers, wild flowers, grains and grasses, weeds, poultry feeds, and cattle products, specimen bird houses, balances for seed testing, machine made and hand made aprons, hemmed napkins, linen napkin rings, stocking darning, bird calendars, weather records, and drawings. One member had prepared several mounts illustrating methods of paper folding for little children.

The room also contained a terrarium, an aquarium, an observation ant hill, an observation bee hive, plant presses, and other apparatus used in the work of the class.

Outside there were several pieces of home-made playground apparatus—a teeter, swing, jumping standard, bean bag board and bags, and a rope quoits outfit.

The purpose of the fair was to demonstrate various kinds of activities applicable to rural school conditions. Effort was made to have everything presented the best of its kind, in the belief that standards of high quality should be set for rural entertainments, and to show that good quality gives the most real pleasure, both to the audience and to those who take part.

#### **College Had Big Display at State Fair**

As usual the New York State College of Agriculture was well represented at the New York State Fair at Syracuse.

Nearly every department of the College had an exhibition. Farmers of the State flocked into the halls to see what experimentation had to offer.

The Animal Husbandry Department exhibited charts on the feeding and breeding of farm animals.

The Dairy Department exhibited a model milk house and a model cooling outfit.

The Entomology Department had three exhibitions: a farm fish pond to

demonstrate the use of a small stream in maintaining it, a parasitology demonstration showing some of the relations of some parasites to man and animals and their control and a demonstration of insect pests of crops and their control. An Ornithology exhibition showed the future economic phase of birds.

The Farm Crops and the Farm Management Departments exhibited a model of a farm in Cortland County showing how it was formerly poorly and wastefully arranged and how it was later rearranged for more economical use.

The Floriculture Department spent most of its efforts in acquainting themselves with floriculturists of the State.

The Forestry Department showed varieties of forest trees and seeds.

The Plant Breeding Department made an exhibition of the advantages in using purer seeds in cereal planting.

The Plant Pathology Department exhibited charts and literature on diseases of plants and their control.

The Pomology Department made a specialty of packing.

The Poultry Department made killing and picking demonstrations daily and also gave lectures on poultry subjects in their tent.

The Rural Engineering Department gave two exhibitions; one on leveling and another on a home lighting outfit, showing the utilization of water power.

The Soils Department made an exhibition which principally dwelt upon the maintenance of organic matter in the soil.

The Vegetable Gardening Department exhibited many vegetable varieties.

Professor W. A. Stocking of the Dairy Department was elected president of the National Dairy Instructors' Association which was held at Amherst June 30-July 1.

In the months of May, June and August Professors D. J. Crosby and Montgomery Robinson held conferences in 50 counties of the State for the purpose of arranging for Demonstration Schools in Agriculture and in Home Economics.

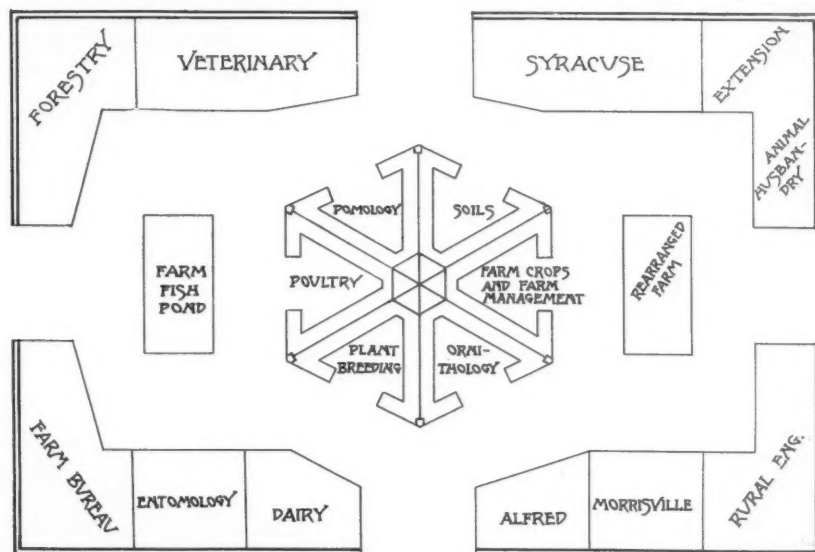
These are five day schools for adult men and women conducted by extension specialists from the College of Agriculture.

Tentative arrangements were made for 71 agricultural schools, as against 59 held last year, and for 35 home economics schools. Seven counties that have never had schools asked for them this year.

Professor A. E. Wilkinson spoke on, "The Crop Situation in New York State," at The New York State Veget-

solve some of their problems in the growing of beans. The fusarium parasite is causing sufficient damage to reduce the bean crop nearly one-half in New York State. This is a parasite which remains in the soil and attacks the roots of the bean plant thereby preventing the roots from getting moisture.

In the month of August a committee was organized at a meeting held in LeRoy. The purpose of this committee is to get aid from the State Legislation



A Plan Showing How the College Was Represented at the New York State Fair

able Growers' Association held in Syracuse, August 30. Dr. Donald Reddick of Plant Pathology Department, spoke on "Diseases of Beans in New York State."

The annual conference of farm bureau managers will be held at the College on October 30 and 31 and November 1 and 2.

Dr. Donald Reddick of the Plant Pathology Department has been working in cooperation with the bean growers of Western New York in helping them to

for a thorough investigation of the bean problem—culture as well as disease.

During the summer the class of students specializing in vegetable gardening work took a two days vegetable gardening trip to Geneva, St. Lima and Rochester. They took another one-half day trip visiting the cannery crops about Cortland. During the week of the State Fair the systematic class took a three days trip to Syracuse, visiting gardens about the city and studying varieties of vegetables exhibited at the Fair.

Professor E. A. White, head of the Department of Floriculture, spent his summer vacation at Amherst, Mass. Professor White delivered two lectures before the Graduate School of Agriculture held at Amherst this year.

The American Rose Society held their summer meeting in Ithaca on June 22 and visited the Cornell Rose Garden. The members of the Syracuse Rose Society motored to Ithaca to inspect the roses on the same day. There are 550 varieties of roses growing in the rose garden, which is the result of the work being done on a co-operative plan between the American Rose Society and the Department of Floriculture.

A meeting of lecturers from the grange section about Ithaca, met on August 2 at the New York State College of Agriculture. State lecturer, George B. Watson, had charge. The whole meeting was one of open and general discussion. There were between 60 and 70 grange lecturers in attendance.

At the annual meeting of the American Association of Poultry Instructors and Investigators, held at Columbus, Ohio, August 2, 3 and 4, Professor J. E. Rice spoke on "Some of the Factors Indicating the Egg Producing Capacity of Fowls." Other Cornell men to prepare papers were A. B. Dann, T. B. Charles, W. S. Young and E. W. Benjamin.

A party of forty-six students of the floricultural classes, under the charge of Professor David Lumsden and Instructor C. L. Thayer, visited the sunken, aquatic and Japanese gardens on the estate of Mrs. Thompson at Canandaigua on August 17.

Dr. H. H. Love, Dr. C. H. Myers and instructor W. T. Craig, all of the Plant Breeding Department, made a trip through the northern part of the State during the month of August. The purpose of the trip was to look after co-operation bureau work with timothy and oats. They visited breeding plants at

Watertown, Chamont, Three-mile Bay, Lefargeville, Canton, Theresa and Bleim Brook.

Professor E. W. Benjamin of the Poultry Department is making an extensive tour of inspection to study methods of marketing poultry products in Missouri, Texas, Iowa, Michigan, Ohio and other Southern and Middle-Western States.

A. B. Dann, Instructor in the Poultry Department, spent second term in graduate study and instructing in poultry at the University of Wisconsin, Madison, Wisconsin.

The publication of the reading course bulletins of the College of Agriculture has been resumed. It was halted by Governor Whitman's veto of the legislative printing bill, but only for a short time. It is understood that a way has been found to continue the printing until the next session of the legislature.

The Cornell football schedule for the fall is: October 9, Gettysburg at Ithaca; October 14, Williams at Ithaca; October 21, Bucknell at Ithaca; October 28, Harvard at Cambridge; November 4, Carnegie Institute of Technology at Ithaca; November 11, Michigan at Ithaca; November 18, Massachusetts Agricultural College at Ithaca; November 30, Pennsylvania at Philadelphia.

At his own request Coach Courtney has been relieved of the responsibility for the active coaching of the university crews. His contract with the athletic association has expired, the office of advisory coach has been created and he has been appointed to the office. The term of the office is not fixed. It is understood that Mr. Courtney will retain his supervision of the crews just as long as health permits him to do so, and that he will give as much of his time and energy to the work as he feels inclined to give. Cornell rowing, which has enjoyed his active direction for twenty-eight years

continuously, will retain the benefit of his invaluable knowledge and experience.

John Lyon Collyer '17, of Chelsea-on-Hudson, has been appointed assistant coach for this year. His selection was Mr. Courtney's own suggestion. Collyer is in his twenty-third year. He rowed in Cascadilla School, stroked the freshman crew and has rowed two years on the varsity eight.

During the summer school a series of lectures on forestry topics was given under the direction of the Forestry Department. The speakers and their topics were: W. S. Carpenter, "Conservation in New York State"; J. W. Toumey, "Who Should Own the Forests"; R. S. Kellogg, "The Function of Lumber Manufacturers' Associations"; A. Gaskill, "Collateral Aspects of Forestry"; F. W. Rane, "The Massachusetts Policy."

On September 11-15, Professor A. E. Wilkinson of the Vegetable Gardening Department held bean demonstration schools in Ontario, Allegany, Livingston and Genesee Counties. During the month of October, Professor Wilkinson will take a cabbage trip through the counties of Cortland, Onondaga, Oswego, Monroe, Orleans, Niagara, Erie, Livingston and Ontario. Twenty-six demonstrations will be held on this trip.

Professor E. W. Benjamin of the Poultry Department spoke before the Annual Poultry Convention of the Massachusetts Agricultural College, held July 19-21, at Amherst, Mass.

Captain Henry T. Bull, U. S. A., former professor of military science and tactics at Cornell (1912-15), has been transferred from the 5th Cavalry to the 17th Cavalry, a new regiment now organizing at Fort Bliss, El Paso, Texas. The military expert of the New York *Evening Post* says that the 17th has every promise of being one of the best regiments in the army, if material is to be judged. His transfer to the 17th

Cavalry has recalled him from Mexico, where he has seen hard service since March as a member of the expeditionary force under General Pershing.

Marion Birdseye, Assistant Professor of Home Economics and Anna Hunn and Bertha E. Titworth instructors in the Department of Home Economics attended Summer School at the Teacher's College, Columbia University, New York City.

Sixteen hundred students were enrolled in the Summer Session of the University. This is the largest attendance in the history of the session. As is usual, a large proportion of the students were teachers in secondary schools or colleges.

The pageant for which the women students of the University have been preparing will be given in October. The place finally selected for its presentation is the women's playground in the Cascadilla ravine. Plans have been made for an outdoor stage and seats for spectators. Members of the committee of arrangements attended the summer session and have carried on the preparations for the pageant through the summer.

Among those who took part in the program in the Graduating School in Agriculture at Amherst, Massachusetts, were Dr. L. H. Bailey, Professor E. W. Benjamin, Professor J. E. Rice, Dr. G. F. Warren, Professor E. A. White and Professor G. A. Works.

H. B. Fuller of the State Relations Service, Washington, was at the College in August studying methods of administration of the farm bureau work in this State and getting information on the handling of reports and other material.

Professor W. A. Stocking of the Dairy Department, attended a Field



Meeting of the State Dairymen's Association held at Warsaw, June 25, 1916. Professor Stocking spoke on "Clean Milk."

Professors Martha Van Rensselaer and Flora Rose motored to New Hampshire the week after summer session to spend a month in the White Mountains.

Helen Knowlton who has been instructor in the Home Economics Department for the past four years has accepted the position as Dean of Women and head of the Home Economics Department in the State College of Agriculture at Durham, New Hampshire.

During the past summer the Department of Soils has brought clay soil from Jefferson County down to the College for the purpose of experimenting on it for its fertilizer needs. The soil is taken up in layers to three feet in depth and

here at the College it is experimented upon for several years the layers being retained exactly in their original position as to depth.

Susan Balkey instructor in the Department of Home Economics for the past two years is to be in charge of the Department of Home Economics in the State Normal School at Williamantic, Conn.

Janet Smtih who has been assistant manager of the Cafeteria during the past year is to take charge of the lunch room at the Central High School, Washington, D. C.

At the meeting of the American Poultry Association in Cleveland, Ohio, August 7-11, Professor J. E. Rice delivered addresses at two different sessions of the meeting.

## The Winds of Day and Night

Awake! Away!

Urges the wind today.

Follow me, follow me far away!

Leave your body to toil and pine

But cast your soul in the midst of mine.

Let it blow wherever I go,—

Up to the skies or out to sea,

Over the hills to a fair country.

Give me your soul at morning dew;

At dusk I'll bring it back to you,

As clean as I and as glad and high.

What do you say?

Urges the wind today.

Peace! Be still!

Over the darkened hill,

Blessing, caressing the sleeping land

With the lingered touch of a mother's hand,

Airily poised, with footsteps light,

Haltingly wander the winds tonight,

Pausing here and again to see

That all things are as they ought to be.

They do not speak, they do not sing

Or challenge the soul to anything.

Only they move, and their passing by

Is the rise and fall of a lullaby.

Rustle and thrill, rustle and thrill

Hear how it blesses, caresses and thrills.

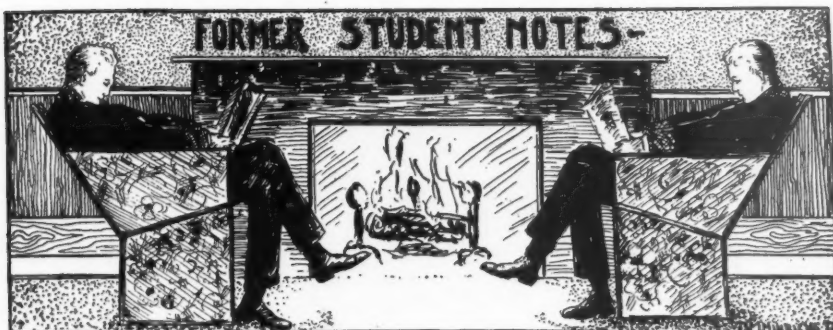
Rustle and thrill! Peace, be still!

Far away o'er the western hill

The master wind of the day is gone,

And the mothering winds of night sweep on!

A. P. N. '18.



'82, B. S.—Herbert D. Schneck is practicing medicine, giving special attention to diseases of the eye and ear. Dr. Schneck is located at 75 Halsey Street, Brooklyn. Since the death of his father in 1914 he has been managing his father's farm of 155 acres at Union Springs.

'84 B. Ag.—Nelson A. Welles is located at 861 College Avenue, Elmira. He is manager and joint owner of the Welles Lumber Company in Pennsylvania and also director of the Eureka Lumber Company, Washington, N. C. and of the Nolunint Lumber Company, British Columbia.

'89, B. S.—Arthur L. Downs is engaged in general market gardening on a farm near Mattituck.

'98 W. D.—J. D. King, who has been helping Manager Milliman as regular assistant to the farm bureau in Orange County has accepted a position as manager of a large farm near Middletown.

'99, W. C.—L. E. Harrison is in the dairy and poultry business on his farm near West Winfield, which he purchased in 1908. Mr. Harrison is now stocking his farm with pure bred Holstein cattle.

'99, W. C.—W. L. Markham returned to the College in '04 for the winter dairy course. In '08 he returned to the College where he was assistant instructor in the Dairy Department. Up to May 1913 his time was spent on a dairy farm in Chautauqua County, lecturing much of the time during the winters with the farm-

ers' institute force from Albany. One winter was spent in the field for the Extension Department of the College. In May 1913 he accepted a position as Farm Bureau Manager of Wyoming County. In February he accepted a similar position in Erie County which position he still holds.

'00—R. W. Webster, after leaving Cornell, taught chemistry in Peddie Institute, Hightstown, N. J., and at the Chicago Manual Training School, Chicago, Ill., also at the M. D. Rush Medical College, University of Chicago. Since 1904 he has been a physician and writer on biological subjects, located at Slatesville. He has also been with the Fellow American Academy of Medicine, First Lieutenant of Medical Reserve Corps of the United States Army.

'01, Sp.—Edwin C. Powell has given up farming since the death of his son in 1913. For seven years Mr. Powell has been associate editor of *The American Agriculturist* and for 14 years editor of *Farm and Home*.

'04, W. C.—William C. Hoagland is on the old home farm at Williamson, cultivating the orchard and cleaning and draining the muck land. He maintains a small dairy and ships the milk to Rochester.

'05, B. S. A.—Hayes L. Taylor taught agriculture in Easttown High School, Pa., for five years after leaving the College. The last two years in addition to

being teacher he was also principal. In 1910 he gave up his work as teaching agriculture and began farming on his home farm at Doe Run, Pa., where he is now engaged in the breeding of registered Guernseys and making a specialty of growing alfalfa.

'05, W. C.—Harold Straw is working in creameries and farming for himself in Kinpburg, Maine.

'05, B. S.; A. B.—Burt P. Kirkland may be reached at Portage, Washington. Since leaving Cornell he has studied forestry at the Yale Forest School one year, worked for the United States Forest Service six years, during the last years of which he had supervision of the Snoqualmit National Forest, with headquarters at Seattle, Washington. In 1912 he accepted a position as Assistant Professor of Forestry in the University of Washington, which position he still holds.

As an avocation Professor Kirkland operates a seven-acre fruit and poultry farm near Seattle, the chief feature of which is the utilization of the poultry to do the cultivation in not only the orchards but also the rhubarb, asparagus and all kinds of small fruits—particularly loganberries. The entire place is fenced off into yards with poultry netting. It carries 1200 hens.

'06, W. C.—George W. Potten took over the old homestead farm at Palatine Bridge on leaving the College. After enlarging the farm and doing considerable reforestation he sold the farm in the spring of 1915 and moved his family to 1706 Union Street, Schenectady, where Mr. Potten is now in the real estate business.

'06, B. S.—Charles T. Osborne is running a farm at East Hampton, Long Island. The farming is of a general type, corn, wheat, potatoes and hay being the special crops.

'07, B. S. A.—Marion Gunnison is farming near Erie, Penn. When she purchased the farm in 1907 it was a general farm but she has gradually changed it into a fruit farm of some peaches,

prunes, cherries and currants but mostly of grapes. Miss Gunnison may be addressed at 716 Sassafras Street, Erie, Pa.

'07, Sp.—Ellis M. Santee received his M. D. degree from the Homeopathic Medical College of Missouri in 1890. Since leaving Cornell he has been working for the United States Government and the State of New York. For one year he was director of the Good Will School, Hinckley, Maine. Since then he has been doing farmers institute work winters and concrete construction demonstration work summers.

'07, Sp.—Le Roy Munro has been working on the home farm at Elbridge since leaving the College. He and his father run the business under the name of Frank Munro and Son. They raise grade Belgian horses and are also working into the pure bred Holstein business.

'07, B. S. A.; '08, M. S. A.—Norman H. Grubb was for nearly two years after leaving Cornell in the United States Forest Service at Washington, testing tree seeds. Following this work he went into the Bureau of Plant Industry and was engaged in vegetable investigations at the Arlington Farms, Washington. Since then he has been on an orchard farm in England. He is now planning forest nursery work, there being a prospect for a large demand for trees after the war.

'07, Sp.—M. C. Saile is farming at Le Roy. Besides his general farm work he is experimenting somewhat on corn and soy beans.

'08, B. S. A.—Lewis A. Toan, Farm Bureau Manager of Monroe County, conducted probably the largest and most successful field demonstration ever held in this State at Hilton, on July 21. Between 350 and 400 automobiles brought a crowd variously estimated from 1,600 to 2,000 persons. The object of this big meeting was to watch seven tractors in operation and to inspect 15 field tests on summer dusting, the control of Pear

(Continued on page 48)

# DE LAVAL

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Over 38 years of experience and thousands of tests and contests the world over have demonstrated the De Laval to be the only thoroughly clean skimming cream separator, under all the varying actual use conditions, favorable as well as unfavorable.

#### Supreme in Construction

This applies to every part of the machine—to the bowl, the driving mechanism, the frame and the tinware. The De Laval patent protected Split-Wing Tubular Shaft Feeding Device makes possible greater capacity, cleaner skimming and a heavier cream than can be secured with any other machine.

#### Supreme in Durability

The De Laval is substantially built. The driving mechanism is perfectly oiled and the bowl runs at slow speed, all of which are conducive to durability and the long life of the machine. While the life of other cream separators averages from three to five years, a De Laval will last from fifteen to twenty years.

#### Supreme in Improvements

This has been the greatest factor in De Laval success. Not a year goes by but what some improvement is made in De Laval machines. Some of the best engineers in America and Europe are constantly experimenting and testing new devices and methods, and those which stand the test are adopted.

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With its worldwide organization and with agents and representatives in almost every locality where cows are milked, no stone is left unturned by the De Laval Company to insure that every De Laval user shall get the very best and the greatest possible service from his machine.

#### Supreme in Satisfaction

De Laval users are satisfied users, not only when the machine is new, but during the many years of its use.

#### Supreme in Sales

Because they are supreme in efficiency, construction, durability, improvements, service and satisfaction, more De Laval Cream Separators are sold every year than all other makes combined.

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50,000 Branches and Local Agencies the World Over

In writing to advertisers please mention The Cornell Countryman

**Former Student Notes**

(Continued from page 46)

Psylla, and fall spraying for Peach Leaf Curl. The Niagara and Wyoming County Farm Bureaus, under the management of Nelson R. Peet and H. M. Bower respectively, organized excursions and brought about 300 and 200 men respectively to the meeting. The success of this meeting was due principally to three things: (1) a strong series of demonstrations planned several months ahead; (2) excellent publicity; (3) good organization and work of local committeemen.

'09, B. S.—F. E. Robertson, Farm Bureau Manager of Jefferson County, has prepared a blank and made arrangements for securing data as to the value and efficiency of milking machines among the dairymen of the county. A list of 180 owners of these machines has been secured, and with the assistance of C. W. Gilbert, who has recently come from Chemung County to help Manager Robertson, an attempt will be made to secure information on the value of these machines. It is thought that this will be very valuable to dairymen, particularly in view of the labor problem.

'09, B. S. A.—William H. Stark is engaged in the nursery business at Neosho, Missouri.

'09, D. C.—John P. Porteous had charge of a creamery and made a market milk plant in LeRoy the first year after leaving the College. For the next two years he was superintendent of a market milk plant in Geneva and since then he has had charge of the Dairy Department of the State School of Agriculture at Canton, where a commercial business is carried on along with the school work.

'10, Sp.—D. M. Dey is with the Dey Brothers and Company, Syracuse.

'10, Ph. D.—E. P. Humbert has given up his position as Professor of Agronomy in the New Mexico College of Agriculture for that of Agronomist in the Texas Agricultural Experiment Station.

'11, B. S.—Frank Clothier is on his farm near Angola where dairying is carried on rather extensively.

'11, W. C.—Oscar J. Alberding worked as assistant superintendent of F. B. Jennings's plant in North Bennington, Vt., after leaving the College. From this work he acted as herdsman of the Borden's certified dairy plant at Chatham, N. Y., where he was employed until he purchased a 91 acre farm at Cassville in the spring of 1913.

'11, W. C.—E. E. Toward made cheese at Redwood until December, 1914, when he was put in charge of cheese making for the United Dairy Company of Todi, Ohio. This company takes in 24,000 pounds of milk daily.

'11, Ph. D.—F. S. Harris, formerly Agronomist of the Experimentation of Logan, Utah, has now been made director of that station.

'12, W. C.—Arthur Gilchrist who managed a farm near Union Springs until last year is now engaged on a farm near Palmyra.

'12, B. S.—H. B. Knapp has left the College as Assistant Professor in the Pomology Department and accepted a position as director of the Schoharie Agricultural School at Cobleskill.

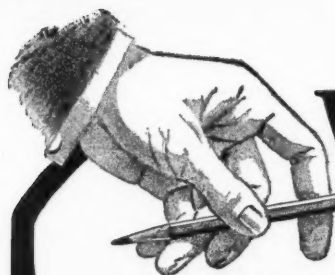
'12, B. S.—C. E. Ladd has accepted a position as director of the Delaware School of Agriculture.

'12, B. S.—Harry Embleton is extension instructor in the Poultry Husbandry Department of the Bureau of Animal Industry in Oklahoma.

'12, B. S.—F. H. Lacy, Farm Bureau Manager of Dutchess County, reports that the use of lime just about doubles the hay crop, sometimes a little more and sometimes a little less. A table prepared from the definitely measured results of a number of tests in the County shows that the increase in the hay crop on the test areas due to one ton of lime was 3401 pounds. The increase due to

(Continued on page 50)





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You know what a good brooder ought to be and to do; you know how to express that in writing. Just sit down and write it out, send it to us with an order for our brooder, and we will sign the guarantee and send you the brooder on a thirty day's trial. If it doesn't come up to *your* guarantee, send it back and we will refund the money without a question.

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is the greatest, most practical coal-burning brooder ever made. Self-feeding, self-regulating, everlasting. Broods 100 to 1000 chicks at a guaranteed cost of less than 6 cents a day. It will do anything any other brooder will do, regardless of price, and do it better.

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#### SPECIFICATIONS

Solid cast iron stove, 52 inch, galvanized hover. Two double-disc thermostats, tandem hitched. Rocker furnace grates, self-cleaning and anti-clog. Check valve hung on knife edge bearings. Gas proof—fire proof—fool proof. Guaranteed to burn more than 24 hours in any temperature with one coaling. Capacity, up to 1000 chicks.

**Agents Wanted** Some good territory still open. An attractive proposition for the right man or firm.

# \$ 16<sup>00</sup>

A Little Higher in the West on  
Account of Freight.



## Former Student Notes

(Continued from page 48)

the use of a second ton of lime was, however, only 101 pounds.

'12, W. C.—L. E. Walters is working and jointly managing the home fruit farm at Irving. The farm comprises 7 acres of grapes, 600 acres of apples, about 10 acres of plums, 150 cherry trees and 55 peach trees.

'13, B. S.—A. B. Williams has gone from Hamburg High School to act as principal of the High School at Burnt Hills.

'14, W. C.—T. M. Avery, Farm Bureau Manager of Nassau County, has been authorized by the Association to publish a membership book, to be issued to all members of the farm bureau association. The idea of this book is that it shall serve as an annual questionnaire, in which the members of the bureau may note down points that come up during the year's farming experience which puzzle them. At the end of the year the book is turned over to the farm bureau and reviewed by Manager Avery who tabulates the questions and suggestions and makes plans for handling them. This is a new proposition and its development will be watched with interest.

'14, B. S., '11, A. B.—Julius Smith, who had formerly been an assistant in Agricultural Economics in the University of Wisconsin, became, last March, an assistant in Market Surveys, Office of Markets and Rural Organizations, United States Department of Agriculture, located at Laredo, Texas. The nature of the work was giving market news on an onion survey. During the potato season Mr. Smith proceeded from Eagle Lake, Texas, to Fort Gibson, Oklahoma, and Fort Smith, Arkansas and from there to Kentucky. His permanent address is Washington, D. C.

Between the time of Mr. Smith's graduating from the Arts and Agriculture Colleges he operated a 200-acre farm at Pennsdale, Pa., where he carried

on general farming. He grew corn, oats, wheat, hay and alfalfa and raised hogs and poultry besides keeping a large dairy of registered cattle.

'14, B. S.—Jeanette Evans is teaching domestic science in the High School of Commerce at Springfield, Mass.

'14, B. S.—H. D. Bauder has gone to Fort Plain, as teacher of Agriculture.

'14, B. S.—W. G. G. Frisbee has left Clymer and gone to Oxford, as teacher of Agriculture.

'14, B. S.—L. E. Cook, who has been teacher of Agriculture at Wooster for two years, will assist in the Rural Engineering Department of the College for the coming year.

'14, B. S.—Glenn J. Wight assisted Manager E. P. Smith in Chenango County during July and August. He has now accepted a position with the Animal Husbandry Department at Amherst, Massachusetts.

'15, B. S.—S. E. Church is farming near Skaneateles. The type of farming is general, dairying and poultry being of chief concern.

'15, B. S.—F. H. Millen is surveying roads for his father in New Jersey and also having supervision of reforestation operations in the Adirondacks for the State Conservation Commission.

'15, B. S.—Winifred is teacher of home making in the Intermediate School of Home Making and Agriculture at Maryland, Otsego County.

'15, W. C.—Newell J. Beatty is situated on the homestead farm at Neuvellon, breeding pure bred Holstein cattle.

'15, B. S.—H. C. Morse has been assisting Manager Ross of the Oneida County Farm Bureau since last April. He has been working on farm management demonstrations.

(Continued on page 52)

## NEXT WINTER

have every room  
comfortable

Are you worrying along with stoves for heating your Homes or Tenant Houses? Stoves are troublesome to care for, they heat a house only in spots and mean carrying coal and ashes thru the living rooms. All this can be avoided by installing an

### INTERNATIONAL Onepipe Heater

Reg. U. S. Pat. Off.

This Heater successfully solves the problem of heating the average farm-home of ten to twelve rooms or less. It comes to you complete and can be easily installed without the use of special tools. It is easy to operate and will heat the whole house at a fuel-cost but little higher than for one good stove.

*Leaves the Cellar Cool for Storing Vegetables*

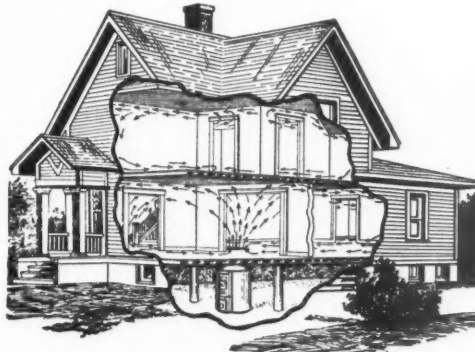
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how the warm  
air diffuses  
everywhere.



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## Cornell Men

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Gentlemen:

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**CARBOLA**  
The Disinfecting White Paint

A snow-white mineral paint combined with the world's strongest germicide. Comes in powder form. Mix with water and put on with brush or sprayer.

### Use It Instead Of Whitewash

to keep barns, poultry houses, etc. clean and sanitary. Your dealer has it.

10 lbs. (10 gals.) \$1 and postage  
20 lbs. (20 gals.) \$2 del'd 50 lbs. (50 gals.) \$4 del'd  
Trial package and booklet for 25 cents and your dealer's name.

### Carbola Chemical Co.

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# H-O Feeds

**P**ERHAPS you don't realize the importance of feeding the right kind of feed. You can't make money from poultry otherwise.

## H-O Scratching Feed

builds bone and tissue. Because it is scientifically correct, it tends to increase the number of eggs per hen.

If your dealer cannot supply you, write for sample, prices and descriptive folder.

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MILLS  
BUFFALO, N. Y.

JOHN J. CAMPBELL  
GEN. SALES AGENT  
HARTFORD, CONN.

## Former Student Notes

(Continued from page 50)

'15, B. S.—T. W. Vann has been regular farm bureau assistant to Manager Underwood in Oswego County since the first of May.

'16, B. S.—Kathryn Francis is teaching home making in Shamokin, Pa. Miss Francis may be addressed at 133 East Dewart Street.

'16, B. S.—Julius Caesar Lattanzi is overseer of the Betty and Solomon Loeb Home Farm for convalescents at East View.

'16, B. S.—Charles H. Graves is agricultural expert for Paseo de Julio, Buenos Aires, Argentine Republic, S. A.

'16, B. S.—G. A. Haskins is farming near Rochester. Apples, alfalfa, beans and market garden crops are grown chiefly. Mr. Haskins may be addressed at Wegman Road Gates.

'16, B. S.—A. P. Hoffman is making plans for following landscape art work. He may be addressed at 603 Hoffman St., Elmira.

'16, B. S.—T. C. Logan is managing the family fruit farm near Lyons. He intends to gradually work into the produce business. His address is 2 Maple St., Lyons.

'16, B. S.—W. L. Webster is managing a fruit farm near Stanley.

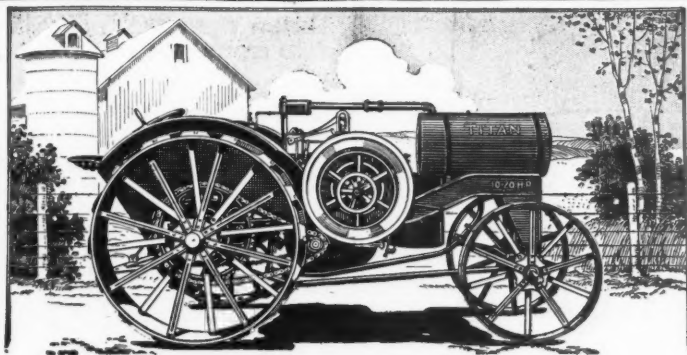
'16, B. S.—H. J. Samuelson, has gone to Morrisville, Minn., as teacher of Agriculture.

'16, B. S.—Ruth Smith, last year's woman editor of the *Countryman*, has gone to Burnt Hills, as teacher of home making, in the Domestic Science Department.

'16, B. S.—J. A. Vanderslice, last year's editor of the *Countryman*, is located at 17 West Forty-second Street, New York City, where he is working with the publishers of *The Field*.

(Continued on page 54)

In writing to advertisers please mention The Cornell Countryman



## Titan 10-20 \$900 Cash f. o. b. Chicago

**T**HERE is hardly a farm with a hundred acres or more of tillable land but what has belt work enough to keep a 20-H. P. engine busy when not doing field work. This belt work alone will in most cases pay the entire yearly fuel bill of a **Titan 10-20** tractor. Add to this the deep plowing, disking, harrowing, seeding, fallowing, harvesting and hauling the Titan will do during the year, at less than horse cost, and you see at once what a gilt edged investment this tractor is.

Power, strength and economy as combined in the **Titan 10-20**, mean everyday usefulness. It has power and strength to take care of the everyday work of the farm. It is small enough to run light machines with economy. It works successfully on kerosene. It reduces the number of work horses needed. It saves so much in so many different ways, and does so much that it cannot help but pay for itself long before it is worn out.

Write for full information about this **Titan 10-20** — the tractor that pays for itself, that furnishes power at kerosene cost (less than half the price of gasoline), and that is just the right size, weight, and style for farms of 100 acres or more.

**International Harvester Company of America**

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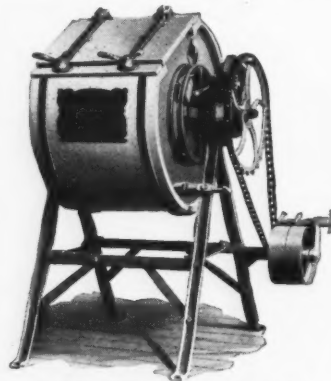
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Champion Deering McCormick Milwaukee Osborne Plano



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## The New Way in Home Butter-Making

**POUR** in your cream and take out the finished butter—all ready to pack.

Everything done in the same container—churning, washing, working, salting, coloring, etc. The whole operation usually completed in less than 25 minutes. All done by mechanical and scientific processes, as in the big creamery churns, assuring highest grade butter every time, the proper amount of moisture and no loss of butter-fat. No experience or skill required with the

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Electric, gas engine and hand-operated models. Thousands are making a success in the butter business with this most efficient of home butter-makers.



Write for a copy of a most interesting book on the butter-making business, explaining the many unusual features and improvements of the Minnetonna Home Creamery.

**Minnetonna Company,**

2001 Farmers Bank Bldg.,  
Owatonna, Minn.

### Former Student Notes

(Continued from page 52)

'16, B. S.—B. W. Kinne, last year's business manager of the *Countryman*, is employed by Wallace C. Richardson, the Eastern representative of the standard farm papers. He may be addressed at 381 Fourth Avenue New York City.

'16, B. S.—F. D. Brooks has accepted a position as instructor of poultry husbandry in the agricultural school at Delhi.

'16, B. S.—Frank W. Lathrop, a former editor of the *Countryman*, has resigned as teacher of agriculture in Canandaigua Academy and accepted a position as teacher of agronomy in the Schoharie Agricultural School at Cobleskill.

'16, B. S.—V. C. Whittemore has gone to Plattsburgh, as teacher of Agriculture.

'16, B. S.—H. J. Curtis has gone to Red Creek, as teacher of Agriculture.

'16, B. S.—W. A. Tubbs has been assisting Manager Crofoot in Cattaraugus County since last April. On August 15 he completed his work in Tompkins County and accepted a position as farm management demonstrator in New Hampshire.

'16, M. S. A.—C. W. Carrick has gone to the County School of Agriculture at Walpole, Mass., as teacher of Poultry Husbandry.

'16, B. S.—H. C. Funk has gone to the County School of Agriculture at Walpole, Mass., as teacher of Farm Management.

'16 B. S.—A. R. Eldridge has been assisting Manager Avery in Nassau County since May. His work has consisted mostly in helping the farm bureau co-operators carry on the field tests.

'16, B. S.—P. R. Young has gone to Delhi State School of Agriculture, as teacher of horticulture.

(Continued on page 60)

Where you saw it will help you, them and us

# NOW—

Every new man likes to make real, lasting friendship with his fellows, and he likes to get real solid things he needs in his college work when he knows the man selling is a fellow student, selling on the principle of making (*just a little*) on each article—that is

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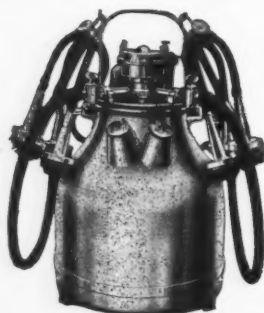
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In order to better serve the students we have moved from 316 College avenue into larger quarters and can now serve you with everything you need.

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The best Cornell Pennants in  
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Jewelry, Stationery, Tobacco,  
Newspapers and Periodicals.

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new location 411 College Avenue.



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for use of Creameries, Cheese Factories, Milk Shippers and Dairymen.

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### SCRUPULOUS CLEANLINESS

constant sterilizing of all receptacles and machinery, incessant care in every step from the cow to your table, together with perfect pasteurization make Sanitary Ice Cream and Milk Co. products absolutely safe for the whole family, from the baby up.

Let us add your name to our rapidly growing list of satisfied customers. It costs no more to receive this protection.

*We invite your inspection at any time.*

**SANITARY ICE CREAM AND MILK CO., Inc.**

**701 W. State St. Both Phones**

### Opportunities for Women in Agriculture

(Continued from page 33)

Vegetable gardening seems to be better adapted to woman's management than the lines mentioned above. However, the early hours of the morning at which vegetables are put on sale in nearly all markets makes it undesirable for women to give personal attention to the details of marketing.

Floriculture attracts a relatively large number of women, and in many respects seems to be well adapted to woman's work. In some of its phases there certainly is an opportunity for women to display their skill, tact and taste. The humidity and high temperature of the green-house and the low temperature of the floral design room may not be favorable to good health.

It is claimed that in both vegetable gardening and floriculture there is considerable demand for women to do school garden teaching and to give instruction to women in correctional institutions. The production of improved vegetable and flower seeds also seems to hold out some inducements, but plant breeding in general seems to be based on and must follow the practical production of crops.

Bee keeping would seem to lend itself to woman's management better than most lines of agricultural work, though not a large proportion of women seem to have entered the ranks of professional bee keepers. There is no reason why women should not learn to make boxes and even hives as well as men, and it would certainly seem that in the care of bees and their products they would excel.

Poultry industry at present attracts the largest ratio of women workers, and seems to hold out the greatest inducements. Practically one-fourth of all professional poultry raisers are women, and certainly a large preponderance of the poultry raised on the farms of the country is in the care of women. Professor Rice states that women are es-

(Continued on page 58)

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## ... For Sale ...

The Tompkins Co. Breeders' Association has for sale Holstein, Guernsey and Jersey cows, bulls and young stock of both sexes and bull calves of the leading beef breeds.

Rams and ram lambs of nearly all breeds, Delaines, Rambouillets, Southdowns, Cheviots, Dorsets, etc.

Berkshire, Poland China, Duroc Jersey and Chester White swine.

Students and others interested in the purchase of pure bred stock are invited to call at our office and arrange to see the stock.

Pedigrees of all breeds compiled at the lowest rates. A four generation pedigree for 50c.

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## One Outstanding Characteristic of



is that it does not produce a suds. We mention this first because many milk producers who think of suds and soap as a part of all cleaning oftentimes condemn Wyandotte Dairyman's Cleaner and Cleanser when they first use it, because they see no suds.

The best authorities rigidly advise against the use of soap and soap powders in the dairy, because the soapy, greasy residues, which are invariably left, are breeding places for destructive germs. Wyandotte Dairyman's Cleaner and Cleanser not only has the purest but the most cleansing elements known to all the dairy world. And at the same time it does its cleaning it also makes the sour places sweet and the stale places fresh. Once you have given it a thorough trial, you will always insist that your dairy cleaning be done with it.

Ask your dealer for a sack or write your dairy supply man for a keg or barrel.

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Sole Manufacturers

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*Incorporated*  
SYRACUSE, N. Y.

## Buttrick & Frawley

have always enjoyed  
a good business with  
the Ag. students.

We always strive to  
give full value in

*Clothing,  
Furnishings  
and Shoes*

Give us a call.

## Opportunities for Women in Agriculture

(Continued from page 56)

pecially successful in handling poultry. When called upon to furnish addresses of poultry establishments worth visiting, he invariably suggests some managed by women. A recent report made by a woman is worth summarizing. This woman had graduated from Cornell in Arts. She went to work in the office of her father, who was a manufacturer of hardware. At the office work her eyes failed. She returned to Cornell and took the Winter Course in Poultry Husbandry in 1911-12. Going home in the early spring of 1912 she began to establish a poultry business on the home village lot. In the midst of this effort her father's factory burned. Instead of re-building the factory he sold his business and joined her in the poultry enterprise. A twenty acre place near another village was purchased, and the family, with the incipient poultry business, moved to it. The family consisted of father, mother and daughter. At the end of the first year the family labor income arising from the poultry business was minus \$330. At the end of the second year it was \$1055; the third year \$1575; and the fourth year (1915) \$2213. Not all persons who start in the poultry business can accomplish as much, but several women have reported results to the Department of Poultry Husbandry that are eminently satisfactory.

My thought is that the considerations presented in this article lead to the conclusion that in most lines of agriculture woman is at a disadvantage in comparison with man, though some women have the force and ability to overcome this disadvantage; but that there are other lines in which woman is likely to do attractive and profitable work. These special lines seem to be attractive to women in the following order: poultry, floriculture, apiculture, small fruits, gardening. It often happens that two or three of these lines may be united in a single enterprise to good advantage.

In writing to advertisers please mention The Cornell Countryman



# ANNOUNCEMENT

**YOU** ARE invited to inspect our Fall and Winter woolens. The patterns are the best the market could produce. ¶ The styles for this season were selected from the most authoritative sources and comprise the latest effects in Gentlemen's Clothes, Young Men's Styles and Sporting Garments that will give entire satisfaction.

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111 NORTH AURORA STREET

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Give the roots a chance

You can go deep without bringing up trash, stones or manure. You can at the same time pulverize and level. For thrifty crops rely upon the forged sharp, penetrating disks of the

**Cutaway**  
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Disk Harrow—Single or Double Action—light in draft and built for a lifetime of service. If your dealer has not the genuine CUTAWAY, write to us direct. Be sure to write us for our new free book, "The Soil and Its Tillage."

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Maker of the original CLARK disk harrows and plows

204 Main St., Higganum, Conn.



This Double Action Harrow saves one disking

## Kalamazoo Silos

### YOU MAY DARN, WASH OR PATCH

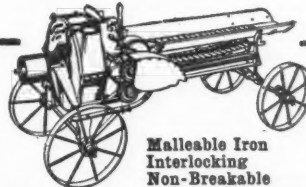
Cotton, wool or linen fabrics, you may repair leather, use either over and over but a pound of butter, cheese, poultry, beef, mutton or pork used today calls for its reproduction tomorrow

**HOW** to lower cost, to increase amount produced—at same time improve the value of your main asset which is

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Agents should have Kalamazoo plan, with sugar, for buyer and sales agents. Dept. 635.



Malleable Iron  
Interlocking  
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### CUTTER WHEEL

New and Distinctive Features of Service and Safety in Operation

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Where you saw it will help you, them and us

## FALL SCHEDULE OF EVENTS

### OCTOBER—

- 9 Football—Gettys-  
burg ----- 3:00 P. M.
- 14 Football—Williams 3:00 P. M.
- 21 Football—Bucknell 2:30 P. M.  
Freshman  
Football—Hotchkiss School at  
Lakeville, Conn.
- 27 Association Football—Prince-  
ton ----- 4:00 P. M.
- 28 Football—Harvard at Cam-  
bridge, Mass.  
Freshman  
Football—Kiskiminetas  
School ----- 2:30 P. M.



## HERRON'S

Opp. Tompkins County Bank

### Former Student Notes

(Continued from page 54)

'16, B. S.—W. D. Chappell has gone to Canandaigua Academy, Canandaigua, as teacher of Agriculture.

'16, B. S.—H. E. Gayman is teaching Agriculture in a High School in Doylestown, Pa.

'16, B. S.—L. J. Mead is with the Standard Oil Company at Shanghai, China, where he went last February. He writes as follows:

"Upon arrival here I found Shanghai to be a real modern city. It is not a beautiful place by any means but is rather a large commercial center. There are about 30,000 foreigners here which are mostly English. I think there are also about 1000 Americans in the city.

"I was kept here in Shanghai and the other 15 men who came along with me were all sent out to various parts of China. I met two of my Cornell friends here and the three of us are running a little home of our own.

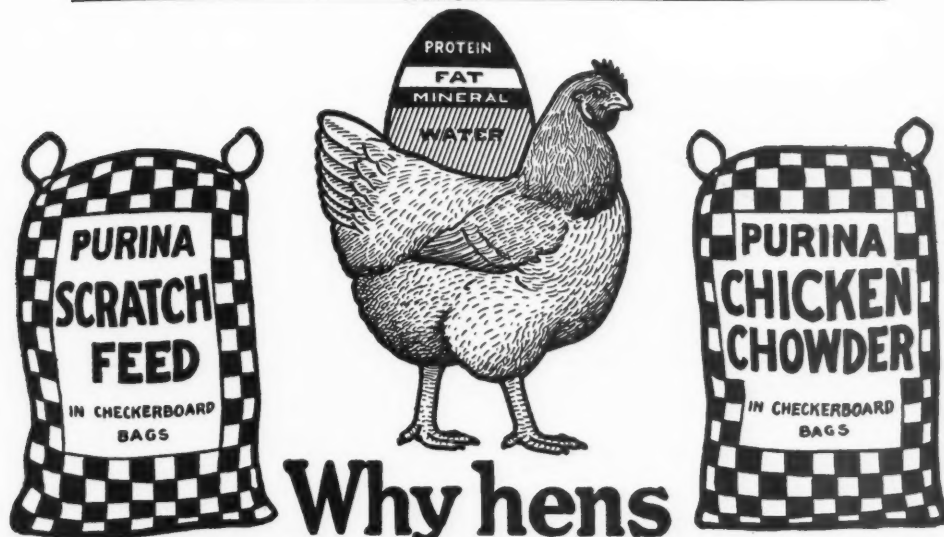
"I enjoy my work a great deal and from all indications the more I get the better I like it. I think that the big question which a fellow wants to settle before taking a position like mine, is whether or not he wants to come to the Orient. Personally I can't find anything wrong with it. The Chinese are a very fine class of people. Of course they are unsanitary in their ways. For instance they wash all their vegetables in filthy, contaminated pools.

"They are however very good farmers. They are still cultivating the same ground which was worked hundreds, yes, thousands of years back and they are still getting good crops. Animal Husbandry seems to be a thing of which they know but little. They have some sheep and hogs but a very poor lot. The cattle are few and the milk which is used comes from the water buffalo. Here again is disease carried easily and we use nothing but the "Carnation Milk." When it comes to poultry, of all kinds the Chinese are right there. Eggs are very cheap and chicken forms one of the main dishes of China. The natives are great on chicken and rice.

"The Chinese are also pretty strong on fish. Only yesterday I saw a very interesting sight out in the country. A Chinaman went past in his boat fishing. For fishing they use trained birds. These birds are well trained and dive for the fish. A string is tied around their necks

(Continued from page 62)

In writing to advertisers please mention The Cornell Countryman



## Why hens never lay half an egg!

The usual method of feeding mostly grain, makes yolks but not enough whites to *complete* the eggs. As the hen cannot lay these *half-made* eggs, she absorbs them back into her system. Missouri Experiment Station tests showed that 100 lbs. of wheat, corn, oats, barley and kaffir corn make (above bodily maintenance) an average of 224 yolks but *only 154 whites*. Based on data from the same experiments, Purina formulas produce, (above bodily maintenance) as follows:

Purina Scratch Feed	247.49 yolks	142.11 whites
Purina Chicken Chowder	182.05 "	282.55 "
Combined Ration	429.54 yolks	424.66 whites

Note the perfect balance of yolks and whites and the large number of each. This combination of Purina Feeds makes the maximum number of *complete* eggs, eggs a hen will lay. That's why we can absolutely guarantee

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on Purina Chicken Chowder if fed with Purina Scratch Feed as directed. You take no risk. Write for further information and for our

**FREE**  
**Poultry Book**  
64 Pages

Contents: Baby chicks, Cures of Diseases, Breeding and Feeding Charts, Best Recipes for Cooking Eggs, Poultry, etc. Plans for Poultry Houses, Trap Nests and Fixtures. Daily Egg Records (Spaces for Keeping), Timely Poultry Pointers, etc. Write for free copy today.

Ralston Purina Co., 966 Gratiot St., St. Louis, Mo.

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Book  
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Can  
Make  
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Powder Makers Since 1802  
Wilmington, Delaware

## Former Student Notes

(Continued from page 60)

to prevent them from swallowing the fish. When they get a fish they bring it to the boat and go after another. This Chinaman whom I saw had about 20 birds but he didn't seem to be getting fish very fast.

"Of course I eat about the same things I would at home. I have a garden and grow my own vegetables. The meet is brought in from Korea and the groceries come from America and England.

"There are two things which I wish you would do for me. While I'm not following agriculture very close I would like to be put on the mailing list for bulletins and also have the *Cornell Countryman* sent me. Send me a bill of what I owe you."

'16, B. S.—H. B. Allen has gone from Le Roy to Chazy Consolidated School, as teacher of agriculture.

'16, B. S.—I. T. Francis has gone to Le Roy High School, as teacher of agriculture.

'16, B. S.—W. B. Cookingham has gone to Atlanta High School, as teacher of agriculture.

'16, B. S.—W. D. Chase, who has been assisting Manager Toan in Monroe County in taking farm management analyses, is now assisting Manager Crofoot in Cattaraugus County.

'16, B. S.—C. W. Gilbert assisted Manager Chubbuck in Chemung County in lime meetings during July and then went to Jefferson County to assist Manager Robertson in taking a milking machine survey in that county. On September 5 he returned to Chemung County to help Manager Chubbuck take farm management records.

'16, B. S.—Roy Harmond has gone to Spencer, as teacher of agriculture.

'16, B. S.—T. H. Woodward has gone to Gilbertsville, as teacher of agriculture.

'16, B. S.—L. R. Hart has gone to Hammondsport, as teacher of agriculture.

(Continued on page 64)

Where you saw it will help you, them and us



Eat To Live

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Eat the Best

**The Best Home Cooking in Ithaca**

**THE STEWART AVE. CAFETERIA**

410 Stewart Ave.

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For Cheese Making on the  
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Tablets**

Also try our

**Danish Butter Color**

It gives that beautiful golden  
June shade and does not affect, in  
the least degree, the aroma or  
flavor of the butter.

**Chr. Hansen's**

Rennet Extract, Cheese Color, and  
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More calves have been raised on Blatchford's Calf Meal than on all other milk substitutes combined.

100 lbs. makes 100 gallons of milk substitute, costing only one-third as much as milk.

Prevents scouring and insures the early maturity of sleek, handsome calves.

It is steam-cooked and no trouble to prepare or use.

**Write for Pamphlet** "How to Raise Calves Cheaply and Successfully with Little or No Milk." At dealers, or Blatchford Calf Meal Factory, Dept. 56, Waukegan, Ill.

### Former Student Notes

(Continued on page 62)

'16, B. S.—R. A. Gerhart has taken up farming near Almond, working in conjunction with W. I. Trask, '16, B. S. They make poultry a specialty with potatoes and hay the principal cash crops.

'16, B. S.—Helen Nish has accepted a position in Ithaca for the coming year.

'16, B. S.—J. T. Hohmann may be addressed at 7 Parkside Court St., Brooklyn.

'16, B. S.—Milton B. Porter is planning to work on the family farm at Ransomville. The chief crops are apples, peaches, pears, with beans as the chief field crop.

'16, B. S.—J. R. Mailler is employed by the Health Department of New York City, as food inspector.

### If You Read This Adv. You Will Know More About Us

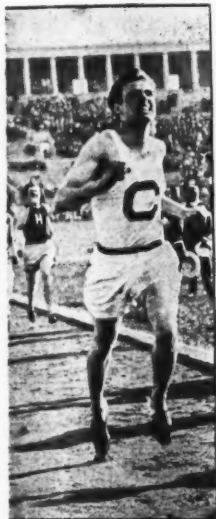
The Stover Printing Co. was founded in 1908 and since that time has grown from a one-man shop to its present size. The owner, A. B. Stover, has been in Ithaca for the past sixteen years and during that time it has been his privilege to serve students of Cornell University and study their special needs.

We are equipped to supply you with anything in the printing line. If we cannot do your job so that you will be satisfied we will tell you and no matter what work we do for you (and we hope to be favored with some) you can rest assured that it will be delivered RIGHT AND ON TIME.

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*"Everything for Athletics"*

*Ask Your Grocer for*

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FOR SALE EVERYWHERE  
Scientifically made from the best ingredients obtainable, in a clean bakery

Call and see for yourselves

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## PURE MILK

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¶ Our milk supply comes from selected dairies of Tompkins County brought to your door under scrupulously clean and sanitary conditions.

¶ Every detail of collecting, bottling and delivering is under my personal supervision.

¶ I will be glad to serve you.

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*Suits delivered  
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## Round Worms in Poultry

Circular Number 150 of the Agricultural Experiment Station of the University of California, at Berkeley. By W. B. Herms and J. R. Beach. Available by application to the office of the Dean.

This is our idea of a useful farmers' bulletin. It is printed in clear, plain type upon a double folder, eight pages. One of these pages is taken up with a list of the station publications and another two by half-tone illustrations, leaving just five pages of reading matter. In these five pages the authors employ plain English to give an adequate idea of the life history of the Round Worm and to tell the way they have found of eliminating it from a flock.

The adult female deposits a large number of microscopic eggs in the intestine of the fowl. These pass out with the droppings and presumably remain dormant until again taken into the digestive track of another individual. There they hatch and in about three weeks attain maturity and start another cycle. "It is therefore evident that a campaign to control the round worms involves both *treatment* of the fowl in order to expel the worms and *disinfection* and *sanitation* of the coops and runways to prevent reinfection." Extensive experiments were carried out in order to determine the best method in both cases.

Tobacco stems, finely chopped, steeped in water for two hours and mixed with mash, were found to be far and away the best medicine for expelling the worms. Two doses of this mixture proved sufficient to free from worms a badly infected flock. The treatment costs but ten cents per hundred fowls.

To destroy the worm eggs and thus prevent reinfection, a solution of one ounce of corrosive sublimate to eight gallons of water, applied at the rate of a gallon to every ten square feet of surface, proved most effective. A combination of the two treatments absolutely eliminated worms from the experimental flock.

R. L.

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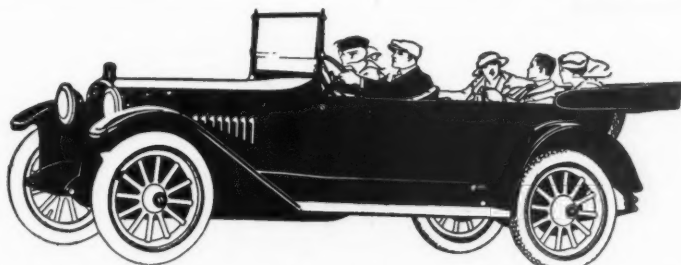
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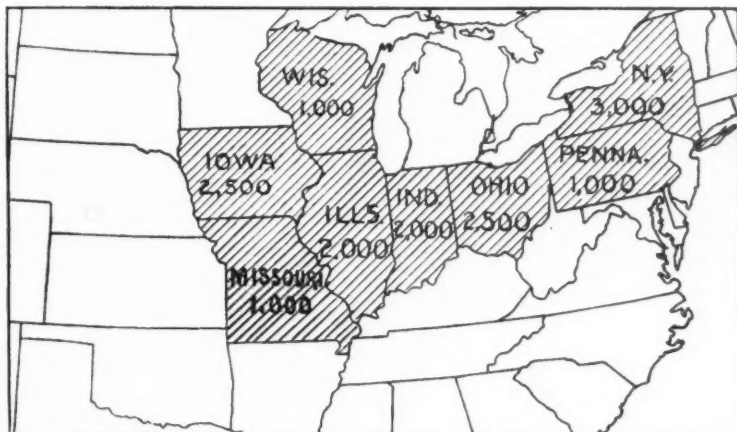
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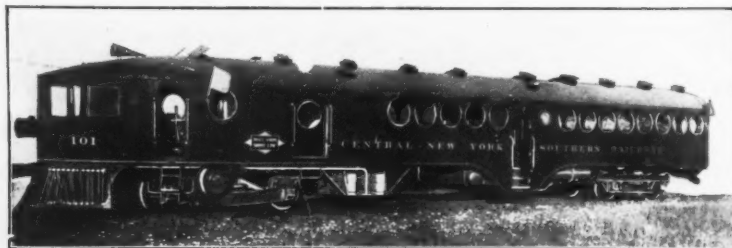
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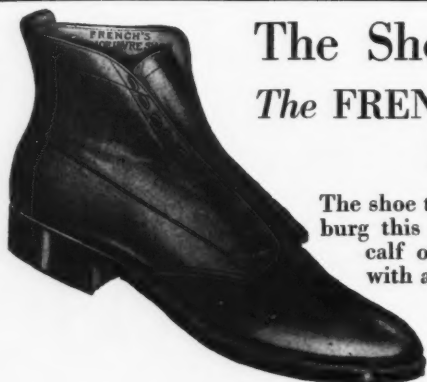
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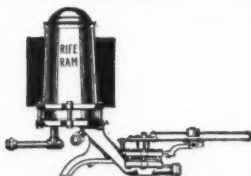
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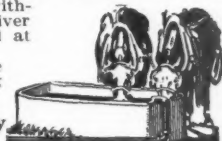
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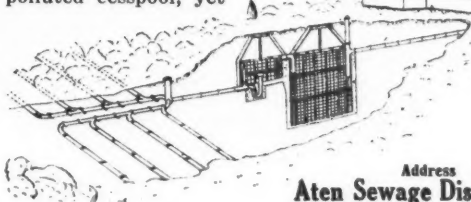
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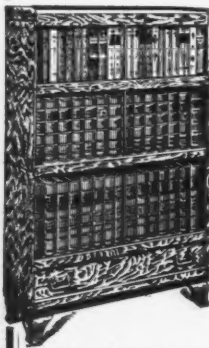
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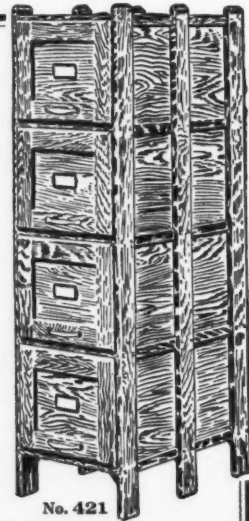
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